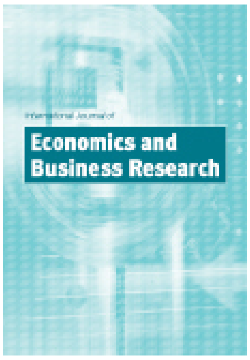

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A universal financial inclusion index covering banking, insurance and pension services in India

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Abstract: To create a universal social security system for all Indians, especially the poor and the under-privileged, three social security schemes namely, Pradhan Mantri Suraksha Bima Yojana, Pradhan Mantri Jeevan Jyoti Yojana, and Atal Pension Yojana were initiated by the Government of India in 2015. In the paper, a new universal financial inclusion index (FIU) covering banking, insurance, and pension parameters in India are developed. Given that all parameters used in financial inclusion index have separate units, all parameters are normalised using the min-max method of normalisation. The Euclidean distance method is used to assess the distance between any two points in an n-dimensional space. FIU is compared to the financial inclusion index covering banking parameters only. The FIU is a multi-dimensional index that captures values of various banking, insurance, and pension dimensions on the scale of 0 to 1, where 0 indicates complete financial exclusion and 1 indicates complete financial inclusion.

Keywords: universal financial inclusion; PMJDY; PMJJBY; PMSBY; APY; multi-dimensional index.

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R. Murugesan with more than 25 years of teaching and research experience. He has many international publications with a category of SCI, ESCI, and Scopus, to his credit. He has two sponsored research projects of which one is sponsored by Indo-UK-UKIERI. His area of interest includes econometrics, industrial economics and DL techniques.

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1 Introduction

Financial inclusion (FI) is defined as convenient access to financial products and services including savings, remittance, credit, government-supported insurance, and pension products to small and marginal farmers and low-income households at a reasonable cost (RBI, 2015). In the United Nation's Sustainable Development Goals (SDGs) of 2030, FI has been explicitly included among the targets of four SDG goals – goal 2: zero hunger, goal 5: gender equality, goal 8: decent work and economic growth, and goal 9: industry, innovation, and infrastructure (UN, 2016), indicating direct benefits of FI in multiple dimensions. Also, it has been shown that FI, particularly digital financial services, can provide solutions to challenges faced in achieving all the 17 SDGs worldwide (UN, 2018).

India's tryst towards FI has a long history. It started with the nationalisation of life insurance companies in 1956 and subsequently the nationalisation of commercial banks in 1969 and 1980, and the nationalisation of general insurance companies in 1972 (RBI, 2020). Given that the large majority of poor reside in rural areas,[1] the drive towards FI in India is primarily geared towards the expansion of rural banking (Basu, 2006). One of the important initiatives taken by the Government of India is to launch Pradhan Mantri Jan Dhan Yojana (PMJDY) on 28th August 2014 to provide universal access to banking services with a basic banking account, access to need-based credit, remittances facility, insurance, and pension to the weaker sections and low-income group.

To create a universal social security system for all Indians, especially the poor and the under-privileged, three social security schemes namely, Pradhan Mantri Suraksha Bima Yojana (PMSBY), Pradhan Mantri Jeevan Jyoti Yojana (PMJJBY), and Atal Pension Yojana (APY) were initiated by the Government of India from May 2015. PMSBY scheme is available to cover the insurance in case of death or disability by accident, whereas PMJJBY covers life insurance in case of death due to any cause. APY is a pension scheme to provide social security for unorganised sector workers not covered under any organised pension scheme. On 23rd September 2018, the Government of India launched the largest health insurance scheme in the world, Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PM-JAY), to meet SDGs.

As of 5 August 2021, the PMJDY scheme covered 42.83 crore beneficiaries linked with a bank deposit of ₹142.948.46 crore. In contrast, accounts coverage by PMJJBY, PMSBY, and APY are 6.96 crores, 18.54 crores, and 2.23 crores respectively by 31 March 2020. Most of the schemes are at the individual level across states except PM-JAY which is implemented at a family level. The scheme PM-JAY has coverage of 13.4 crore population by 31 March 2020.

This study is an attempt to create the new Universal Financial Index (FIU) across states in India and can be compared with the commonly used Banking Financial Index (FIB). This study is an attempt to analyse the coverage of insurance schemes in India across states and explore the penetration possibility in comparison to the population covered under PMJDY, a flagship scheme for FI.

2 Financial inclusion and insurance schemes in India

Financial inclusion is the process to ensure universal access not just to open bank accounts, deposits, and loans but other financial services such as insurance and pension as well at an affordable price (Prasad et al., 2020). As per CRISIL-Inclusix (2018), financial inclusion is "the extent of access by all sections of society to formal financial services such as credit, deposit, insurance, and pension services." In India, it began with the nationalisation of life insurance companies in 1956, bring the mass into the system by cooperative movement in the 1960s followed by private-sector lending, afterward the nationalisation of commercial banks in 1969 and 1980, the nationalisation of general insurance companies in 1972, the formation of Regional Rural Banks (RRB) in 1975 and the National bank for Agriculture and Rural Development (NABARD) in 1982 (RBI, 2020).

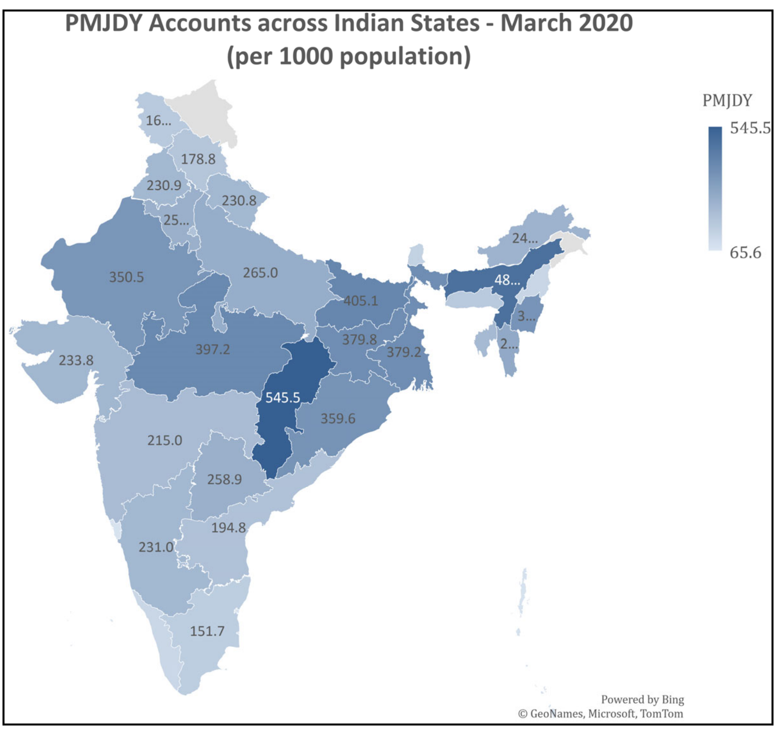
A number of studies focused on the direct association between financial inclusion and the growth of an economy. Researchers in the cross-country studies (Rousseau and Watchel, 2005; Berentsen and Shi, 2008; Masoud and Hardaker, 2012; Barajas et al., 2012; Ruzive et al., 2021) have noticed that financial inclusion is indirectly associated with economic growth. The linkage between the economic system and financial systems shows the heterogeneity across countries due to regulatory/supervisory characteristics (Barajas et al., 2012; Niankara and Muqattash, 2020). Beck et al. (2007) revealed a new set of banking indicators across countries, strongly associated with economic development. Sarma and Pais (2011) examined various macroeconomic and social factors strongly related to FI, like income, literacy, and inequality. Lenka and Barik (2018) have exhibited the unidirectional causality from the growth of mobile and Internet services to expanded financial inclusion in the SAARC countries. Further research (Ghosh, 2011; Mehrotra et al., 2009; Sharma, 2016) has identified the positive relationship between financial inclusion and economic growth. Kumar and Mohanty (2011) recognised that FI is a prerequisite for inclusive development in SAARC countries and their study underlines illiteracy, distance from banking provisions, lack of interest facilities, and high-interest rates as the main barriers to FI.

The previous studies on the financial inclusion index demonstrate multiple dimensions of financial inclusion measures in terms of banking or development indicators. To measure 'financial inclusion' using the banking indicators, Sarma (2008) and Arora (2010) built a multidimensional index of financial inclusion. Demirgüç-Kunt and Klapper (2012) suggested a new set of indicators including both supply and demand-side based on the Global Findex Database developed by the World Bank. Most of the previous studies (Gupte et al., 2012; Park and Mercado, 2015; Sarma, 2008; Sethi and Sethy, 2018; Yadav and Sharma, 2016) used indicators for financial inclusion such as branch penetration (BP), access and usage of financial services only across countries. Kendall et al. (2010) developed a measure for financial across 139 countries by introducing a new set of indicators by type of financial product and by type of the institution such as commercial banks, state-run banks, cooperatives banks, and microfinance institutions (MFIs).

Some of the studies are focused to measure financial inclusion in India at more granular such as state-level or district level. Chakravarty and Pal (2013) developed a conceptual framework for the financial inclusion index to conduct a state-wise analysis in India and concluded that geographic penetration of banks and credit availability are the key policy objectives for expanding financial inclusion. Kumar (2013) concluded that region-wise socio-economic and environmental factors have an important role in determining financial inclusion. CRISIL-Inclusix (2018) has developed the financial inclusion for India known as CRISIL-Inclusix including insurance and pension indicators at the national level, state level, and district level. Goel (2021) analysed the inclusiveness of the financial system across states in India and concluded that all states and union territories have secured different levels of inclusiveness of the financial system.

While India has observed quick progress in financial inclusion, a lot of steps are expected to ensure adequate access to financial services by the under-served and un-served population of India. Considering the various developments on multiple dimensions, India has released its National Strategy for Financial Inclusion for 2019–2024 by Financial Inclusion Advisory Committee (FIAC) in collaboration with the Department of Financial Services (DFS), Department of Economic Affairs (DFA), Ministry of Finance (MoF), Government of India, Reserve Bank of India (RBI), Securities and Exchange Board of India (SEBI), Insurance Regulatory and Development Authority (IRDAI), Pension Fund Regulatory and Development Authority (PFRDA), National Bank of Agriculture and Rural Development (NABARD), and National Payments Corporation of India (NPCI) (RBI, 2020). The rationale to create the financial inclusion strategy and the system is to make the financial system not only pro-growth but also pro-poor to reduce income inequality and poverty, boost social cohesion and shared economic development.

Figure 1 PMJDY accounts enrolment in India (see online version for colours)



Source: Department of Finance Services, Min of Finance (GoI)

Pradhan Mantri Jan-Dhan Yojana (PMJDY), a national mission on financial inclusion, envisages universal access to banking facilities with at least one basic banking account (no requirement to maintain any minimum balance) for every household, financial literacy, access to credit, insurance, and pension facility. In addition, interest is earned on the deposit, an overdraft (OD) facility up to Rs.10,000 and the beneficiaries would get RuPay Debit card having inbuilt accident insurance cover of ₹1 lakh (enhanced to Rs.2 lakh to new PMJDY accounts opened after 28 August 2018). Figure 1 shows the PMJDY accounts enrolment across states (per 1,000 populations) in India as of March 2020. The state of Chhattisgarh shows the highest number of accounts per 1,000 populations followed by the states Assam, Bihar, Madhya Pradesh, Jharkhand, West Bengal, and so on.

The study by Barik and Sharma (2019), found that India has progressed a lot in the case of opening bank account and PMJDY has helped the poor and marginalised people to open a bank account with zero or minimum balance. The accomplishment of opening the largest number of accounts (~1.8 crores) under PMJDY, in one week has been declared as the Guinness Book of world records. While there is improvement in opening the bank accounts, the data reveals that the average balance in these accounts is low and a significant percentage of the accounts are inoperative (Sinha and Azad, 2018). Due to the above fact, it was realised that there is no comprehensive policy that the government has put in place to achieve financial inclusion in the true sense till the time national strategy for financial inclusion was formed for 2019–2024. The major challenges to overcome the financial exclusion are geographical access, high cost, inappropriate banking products, and financial illiteracy (Schuetz and Venkatesh, 2020).

PMJDY accounts are eligible for Direct Benefit Transfer (DBT), Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY), PMSBY, APY, and Micro Units Development & Refinance Agency Bank (MUDRA) scheme. In the scheme PMJJBY, a one-year term life cover of ₹2 lakhs is available to all bank account holders under PMJDY in the age group of 18 to 50 years, for a premium of ₹330/– per annum per subscriber. The scheme PMSBY, a renewable one-year accidental death cum disability cover of ₹2 lakhs, is offered to all bank account holders under PMJDY in the age group of 18 to 70 years for a premium as low as ₹12/– per annum per subscriber. The aim of the pension scheme APY is to provide financial needs in old age and subscribers will get a monthly pension in the range of ₹1,000 to ₹5,000 after completing 60 years of age depending on the contribution by the individual in the age group of 18 to 40 years.

There is no study to capture all major insurance and pension schemes implemented across states in the financial inclusion index, except the Inclusix index created by CRISIL-Inclusix (2018). In the Inclusix index, the four parameters are used: BP, credit penetration, deposit penetration, and insurance penetration but there is no consideration of pension schemes in the index. The previous study was done by Sarma and Pais (2010) also focused only on the banking indicators: banking penetration (number of bank accounts), availability of banking services (number of bank branches), and usage (credit-debit ratio with GDP).

In this study, our focus will be on the schemes PMJJBY, PMSBY, and APY with an assessment of PMJDY across Indian states and analyse the growth and potential penetration of these schemes. In our study, we also evaluated the insurance schemes PM-JAY in the universal financial inclusion, applied at a family level, by creating the index across states.

3 Data sources and methodology

Our main data related to PMJDY, PMJJBY, PMSBY, and APY is gathered through right to information (RTI) requested for each scheme from the Department of Financial Services, Ministry of Finance (Government of India). The data on PMJDY was collected using RTI to cover the number of accounts opened under PMJDY as of March 2020 in lakhs. Data on both PJJBY and PMSBY was provided to us in terms of gross enrolment in the schemes as of March 2020. Data on APY was collected to cover the total number of enrolments registered under APY as of March 2020.

Data on PM-JAY was extracted from the official website of PM-JAY.[2] Data related to the banking indicators are extracted from RBI's official website.[3] The credit-debit ratio was calculated for March 2020 using the data extracted from RBI on both credit and debit amounts in crores. The number of BP, in lakhs, was also extracted from the RBI database across states. Similarly, the number of deposit accounts penetration (AP), comprise of current, saving, and term accounts, are extracted from RBI.

To compute the universal financial inclusion index and understand the penetration of insurance and pension schemes in India, we have calculated the state-wise financial inclusion index in two ways:

- Banking financial inclusion index (FIB): In the FIB index, we used the three parameters related to banking indicators across states only such as CREDIT_DEBIT_RATIO (CD) of scheduled commercial banks, NUMBER_OF_BRANCHES (BP) per lakh population, and NUMBER_OF_ACCOUNTS (AP) per lakh population. In this index, we have not incorporated any variable related to insurance or pension schemes.
- Universal financial inclusion index (FIU): In the FIU index, we used banking indicators, insurance, and pension indicators. In this approach, we have added indicators related to insurance and pension schemes with the banking indicators used in the FIB. In the FIU index, we added the parameters from the insurance and pension schemes such as 'PMJJBY', 'PMSBY', 'APY', and 'PMJAY' along with banking parameters credit-debit ratio, number of branches, and accounts.

Given that all parameters have separate units, all parameters are normalised using the min-max method of normalisation:

$$Xi(Normalised) = \frac{Xi - X(\min)}{X(\max) - X(\min)} * 100$$

Xi value implies a particular parameter for the state '*i*', *X*(min) and *X*(max) represent minimum and maximum value for the specific parameter observed across all states. Normalisation transforms the data for every parameter into a scale of 0 to 1; 0 indicates the complete financial exclusion and 1 indicates the complete financial inclusion. The normalised parameter indices are free of units and dimensions and are easily aggregated.

Our method is akin to the methods used by the United Nations Development Programme (UNDP) for estimation of recognised development indices such as the Human Development Index (HDI), Human Poverty Index (HPI), etc. except for the two changes. Unlike the UNDP's methodology of using an average, our index is built basis on the distance from the ideal point. The Euclidean distance method is used to assess the distance between any two points in an n-dimensional space.

In this study, we have computed both traditional financial inclusions based on banking indicators (FIB) and universal financial inclusion based on banking, insurance, and pension indicators.

$$FIB = 100 - \frac{\sqrt{(100 - CD)^2 + (100 - BP)^2 + (100 - AP)^2}}{\sqrt{4}}$$

and

$$FIU = 100 - \frac{\sqrt{\begin{array}{l}(100 - CD)^2 + (100 - BP)^2 + (100 - AP)^2 + (100 \\ -PMJJBY)^2 + (100 - APY)^2 + (100 - PMJAY)^2\end{array}}}{\sqrt{7}}$$

This approach of aggregation, contrasted with the averaging method, meets some properties of a development index, viz., normalisation, symmetry (or anonymity), monotonicity, proximity, uniformity, and signalling (collectively termed NAMPUS) (Nathan et al., 2008).

4 Empirical results

Table 1 presents the key indicators used in calculating universal financial inclusion for a selected state which has a population greater than 10 million in March 2020. The table is sorted by population size and indicator values are shown per thousand populations. From Table 1, Telangana shows the highest CD ratio as 113.10, Jharkhand shows the lowest CD ratio as 28.90 and the overall CD ratio at the country level is around 74.32. In terms of branches per thousand population, Uttar Pradesh shows the highest values at 176.23, Jammu and Kashmir shows the lowest value at 17.44, and the overall country-level is 69.02. As far as the number of accounts, including both credit and debit accounts, is concerned, Tamil Nadu has the highest number of accounts per 1,000 population at 2,627, and Uttar Pradesh has the lowest number of accounts at 1,309. The adoption of PMJDY, a flagship scheme of the government to promote financial inclusion, has performed best in Chhattisgarh state and worst performance in Kerala state. Similarly, In the insurance schemes such as PMJJBY, PMSBY, and APY, the best performance can be seen in the states Telangana, Chhattisgarh, and Andhra Pradesh respectively; the worst performance can be seen in the states Uttar Pradesh, Jammu, and Kashmir (for both PMSBY and APY) respectively. The effectiveness of financial programs in Jammu and Kashmir is a less penetrated state in the Northern region (Khaki, 2018).

Using data on banking-related three parameters (CD, BP, and AP) across 36 states in India by 31st March 2020, the FIB index is calculated. The FIB values across states are presented in Table 1. Depending on the value of FIB, states are categorised into three categories, viz.,

1 $0.5 < FIB \leq 1$: high financial inclusion using banking indicators

2 $0.3 < FIB \leq 0.5$: medium financial inclusion using banking indicators

3 $0 \leq FIB \leq 0.3$: low financial inclusion using banking indicators.

In the group of 36 states for which financial inclusion index for banking (FIB index) computed using three dimensions, Chandigarh tops in FIB ranking followed by New Delhi, Tamil Nadu, Dadar Nagar Haveli and Daman Diu, Punjab, Kerala, and Goa in the high financial inclusion category (FIB INDEX > 0.5). In the medium financial inclusion category based on $0.3 < \text{FIB} \leq 0.5$, Telangana leads the list followed by Karnataka, Andhra Pradesh, Ladakh, Haryana, Himachal Pradesh, Maharashtra, Uttarakhand, Sikkim, Gujarat, Puducherry, Jammu-Kashmir, and Chhattisgarh. Among the large states, Bihar, Uttar Pradesh, Jharkhand, Arunachal Pradesh, Assam, Odisha, West Bengal, Madhya Pradesh, and Rajasthan have low FIB index values less than 0.30. All the major states in the southern region have either a high or medium level of financial inclusion FIB index. The small states or union territories such as Nagaland, Lakshadweep, Manipur, Meghalaya, Andaman-Nicobar, Tripura, and Mizoram are underperformed with a FIB index ≤ 0.30.

Table 1 Indicators of financial inclusion for large states (March 2020)

State	*Population (in thousand)*	*CD ratio*	*Branches*	*Accounts*	*PMJDY*	*PMJJBY*	*PMSBY*	*APY*
Uttarakhand	11,129	38.70	21.41	1,956	231	40	168	6
Jammu and Kashmir	12,888	46.00	17.44	1,874	166	29	69	1
New Delhi	23,818	108.60	36.50	2,513	193	45	117	5
Chhattisgarh	27,066	66.20	28.05	1,611	545	60	228	4
Haryana	29,002	68.00	50.97	2,111	258	43	139	5
Punjab	30,101	62.20	65.75	2,268	231	30	158	7
Assam	33,856	45.80	28.41	1,463	483	30	78	4
Jharkhand	35,278	28.90	31.00	1,485	380	27	87	6
Kerala	36,410	67.50	66.17	2,483	118	30	148	4
Telangana	37,289	113.10	53.25	2,202	259	72	195	6
Odisha	43,762	41.20	51.58	1,697	360	42	134	6
Andhra Pradesh	53,660	124.30	72.28	2,000	195	45	165	8
Karnataka	64,410	75.10	105.73	2,392	231	64	148	6
Gujarat	65,532	87.60	85.03	1,750	234	47	112	4
Tamil Nadu	70,617	111.60	116.03	2,627	152	47	142	7
Rajasthan	76,759	85.80	76.47	1,401	350	33	105	4
Madhya Pradesh	82,134	71.00	71.05	1,480	397	36	134	5
West Bengal	96,633	51.90	90.00	1,748	379	28	106	6
Bihar	108,372	35.40	73.97	1,362	405	24	79	5
Maharashtra	125,711	93.00	132.12	1,996	215	41	97	4
Uttar Pradesh	231,425	45.20	176.23	1,309	265	23	89	4
India	1,326,153	74.32	69.02	1,766	289	37	116	5

Table 2 Index of banking financial inclusion (FIB) using three indicators

State	*CD*	*BP*	*AP*	*FIB index*	*FIB category*	*FIB rank*
Chandigarh	0.934	0.575	0.546	0.639	High	1
New Delhi	0.951	0.364	0.615	0.570	High	2
Tamil Nadu	0.912	0.391	0.574	0.568	High	3
Dadra-Nagar-Haveli and Daman-Diu	0.337	0.624	1.000	0.560	High	4
Punjab	0.438	0.614	0.550	0.528	High	5
Kerala	0.497	0.467	0.563	0.507	High	6
Goa	0.154	1.000	0.816	0.500	High	7
Telangana	0.846	0.300	0.474	0.486	Medium	8
Karnataka	0.500	0.390	0.550	0.476	Medium	9
Andhra Pradesh	1.000	0.263	0.417	0.457	Medium	10
Ladakh	0.253	0.690	0.499	0.451	Medium	11
Haryana	0.412	0.441	0.475	0.442	Medium	12
Himachal Pradesh	0.182	0.623	0.498	0.405	Medium	13
Maharashtra	0.871	0.155	0.402	0.398	Medium	14
Uttarakhand	0.245	0.508	0.456	0.393	Medium	15
Sikkim	0.211	0.681	0.382	0.392	Medium	16
Gujarat	0.607	0.249	0.362	0.387	Medium	17
Puducherry	0.486	0.271	0.357	0.365	Medium	18
Jammu and Kashmir	0.328	0.270	0.402	0.331	Medium	19
Chhattisgarh	0.482	0.140	0.339	0.306	Medium	20
Rajasthan	0.616	0.129	0.240	0.296	Low	21
Mizoram	0.129	0.454	0.275	0.274	Low	22
Madhya Pradesh	0.537	0.076	0.274	0.271	Low	23
West Bengal	0.367	0.106	0.364	0.269	Low	24
Tripura	0.219	0.289	0.294	0.266	Low	25
Odisha	0.267	0.200	0.334	0.265	Low	26
Andaman and Nicobar	0.302	0.195	0.156	0.215	Low	27
Assam	0.298	0.073	0.258	0.204	Low	28
Meghalaya	0.219	0.227	0.155	0.200	Low	29
Manipur	0.439	0.025	0.169	0.193	Low	30
Arunachal Pradesh	0.143	0.203	0.226	0.190	Low	31
Jharkhand	0.173	0.083	0.279	0.174	Low	32
Lakshadweep	0.000	0.333	0.219	0.173	Low	33
Uttar Pradesh	0.264	0.036	0.223	0.169	Low	34
Bihar	0.210	0.000	0.235	0.142	Low	35
Nagaland	0.267	0.009	0.000	0.084	Low	36

Considering all three dimensions of FIB independently, the CD (credit-debit ratio) score reveals that the major states such as Andhra Pradesh, Tamil Nadu, Maharashtra, Telangana, Rajasthan, Gujarat, Madhya Pradesh, Karnataka, and Kerala are the outperformed states (CD ≥ 0.50) in terms of credit-debit values and states such as Arunachal Pradesh, Jharkhand, Himachal Pradesh, and Bihar are the underperformed (CD ≤ 0.30). Among the smaller states or union territories, New Delhi has been outperformed with a CD score ≥ 0.50 followed by Chandigarh and Puducherry. Lakshadweep is the worst performing state as far as CD score is concerned.

In terms of BP score, Goa is on the top of the list followed by Ladakh, Sikkim, Dadar-Nagar-Haveli and Daman-Diu, Himachal Pradesh, Punjab, Chandigarh, Uttarakhand, and Kerala with BP ≥ 0.50. Bihar is the worst-performing state in terms of branch penetration followed by the states such as Nagaland, Manipur, Uttar Pradesh, Assam, Madhya Pradesh, Jharkhand, West Bengal, Rajasthan, and Chhattisgarh with BP ≤ 0.30.

Among the major states, Tamil Nadu has outperformed in terms of AP followed by the states such as Kerala, Karnataka, and Punjab with AP ≥ 0.50. The smaller states or union territories such as Dadra-Nagar-Haveli and Daman-Diu, Goa, New Delhi, and Chandigarh have the better performance as far as AP score is concerned. The underperformed states with the lowest AP scores are Nagaland, Meghalaya, Andaman and Nicobar, Manipur, Lakshadweep, Uttar Pradesh, Arunachal Pradesh, Bihar, Rajasthan, and Assam.

The universal financial inclusion index (FIU) is calculated across all 36 states and values are presented in Table 2. Similar to FIB, states are categorised into three categories using FIU values, viz.,

1 0.5 < FIU ≤ 1: high financial inclusion using banking indicators

2 0.3 < FIU ≤ 0.5: medium financial inclusion using banking indicators

3 0 ≤ FIU ≤ 0.3: low financial inclusion using banking indicators.

Rank difference is calculated between FIU rank and FIB rank, to understand the overall performance of the states based on universal measurement of FI. Tamil Nadu has the highest FIU score among all 36 states in India, two ranks above the FIB rank. Other major southern states such as Telangana, Andhra Pradesh, and Karnataka have scored high and secured the ranking in the top four states. It reveals that all the major states in the southern region, except Kerala, have done a good job in implementing the insurance-pension schemes such as PMJAY, PMJJBY, PMSBY, and APY. The other two states Dadra-Nagar-Haveli and Daman-Diu and Punjab have a high universal financial inclusion category and FIU > 0.5. The state of Nagaland has the worst performance in both FIU and FIB indexes. In the low universal financial inclusion category (FIU ≤ 0.3), the major states are Uttar Pradesh, Bihar, Assam, Arunachal Pradesh, Jammu-Kashmir, Jharkhand, and West Bengal; the small states or union territories are Lakshadweep, Manipur, Andaman-Nicobar, and Meghalaya. In terms of maximum jump in the rank difference between FIB and FIU, Chhattisgarh has done phenomenal work in implementing PMSBY and PMJJBY and shown the 11 notches up movement from FIB to FIU. In terms of fall from FIB to FIU ranking, the only major state, Kerala, has the worst performance in implementing the insurance-pension schemes by settling the FIU rank at 13, a downward movement of 7 notches. The union territory Chandigarh has very low performance in implementing PMJAY, average implementation of PMJJBY and APY leads to 19th notch fall in ranking.

Table 3 Universal financial inclusion index (FIU) with all indicators

State	*CD*	*BP*	*AP*	*PMJAY*	*PMJJBY*	*PMSBY*	*APY*	*FIB index*	*FIU index*	*FIU rank*	*Rank diff.*
Tamil Nadu	0.912	0.391	0.574	0.687	0.577	0.553	0.546	0.568	0.579	1	2↑
Telangana	0.846	0.300	0.474	NA	1.000	0.828	0.431	0.486	0.563	2	6↑
Andhra Pradesh	1.000	0.263	0.417	0.878	0.532	0.673	0.582	0.457	0.553	3	7↑
Karnataka	0.500	0.390	0.550	0.632	0.868	0.587	0.433	0.476	0.542	4	5↑
Dadra-Nagar-Haveli and Daman-Diu	0.337	0.624	1.000	0.283	0.774	0.439	0.905	0.560	0.542	5	–1↓
Punjab	0.438	0.614	0.550	0.694	0.276	0.636	0.493	0.528	0.511	6	–1↓
New Delhi	0.951	0.364	0.615	NA	0.546	0.425	0.300	0.570	0.486	7	–5↓
Uttarakhand	0.245	0.508	0.456	0.585	0.446	0.690	0.477	0.393	0.471	8	7↑
Chhattisgarh	0.482	0.140	0.339	0.853	0.804	1.000	0.284	0.306	0.463	9	11↑
Himachal Pradesh	0.182	0.623	0.498	0.265	0.569	0.704	0.536	0.405	0.453	10	3↑
Sikkim	0.211	0.681	0.382	0.274	0.728	0.368	1.000	0.392	0.451	11	5↑
Goa	0.154	1.000	0.816	0.065	0.886	0.556	0.421	0.500	0.443	12	–5↓
Kerala	0.497	0.467	0.563	0.433	0.275	0.586	0.255	0.507	0.427	13	–7↓
Haryana	0.412	0.441	0.475	0.277	0.501	0.537	0.351	0.442	0.422	14	–2↓
Gujarat	0.607	0.249	0.362	0.587	0.568	0.397	0.263	0.387	0.416	15	2↑
Puducherry	0.486	0.271	0.357	0.316	0.473	0.444	0.420	0.365	0.391	16	2↑
Madhya Pradesh	0.537	0.076	0.274	0.715	0.386	0.510	0.385	0.271	0.382	17	6↑
Tripura	0.219	0.289	0.294	0.523	0.451	0.451	0.504	0.266	0.380	18	7↑
Odisha	0.267	0.200	0.334	NA	0.482	0.511	0.473	0.265	0.367	19	7↑
Chandigarh	0.934	0.575	0.546	0.000	0.297	0.371	0.249	0.639	0.362	20	–19↓
Maharashtra	0.871	0.155	0.402	0.251	0.469	0.316	0.273	0.398	0.354	21	–7↓
Ladakh	0.253	0.690	0.499	0.998	0.121	0.065	NA	0.451	0.348	22	–11↓

Table 3 Universal financial inclusion index (FIU) with all indicators (continued)

State	*CD*	*BP*	*AP*	*PMJAY*	*PMJJBY*	*PMSBY*	*APY*	*FIB index*	*FIU index*	*FIU rank*	*Rank diff.*
Mizoram	0.129	0.454	0.275	0.850	0.893	0.361	0.000	0.274	0.343	23	–1↓
Rajasthan	0.616	0.129	0.240	0.571	0.332	0.360	0.289	0.296	0.342	24	–3↓
West Bengal	0.367	0.106	0.364	NA	0.241	0.365	0.468	0.269	0.309	25	–1↓
Jharkhand	0.173	0.083	0.279	1.000	0.221	0.266	0.433	0.174	0.292	26	6↑
Jammu-Kashmir	0.328	0.270	0.402	0.979	0.264	0.174	0.012	0.331	0.289	27	–8↓
Arunachal P	0.143	0.203	0.226	1.000	0.400	0.138	0.191	0.190	0.270	28	3↑
Assam	0.298	0.073	0.258	0.370	0.272	0.218	0.242	0.204	0.243	29	–1↓
Bihar	0.210	0.000	0.235	0.499	0.173	0.225	0.360	0.142	0.230	30	5↑
Uttar Pradesh	0.264	0.036	0.223	0.333	0.153	0.274	0.284	0.169	0.219	31	3↑
Meghalaya	0.219	0.227	0.155	1.000	0.172	0.058	0.112	0.200	0.218	32	–3↓
Andaman and Nicobar	0.302	0.195	0.156	0.165	0.348	0.178	0.028	0.215	0.190	33	–6↓
Manipur	0.439	0.025	0.169	0.427	0.052	0.078	0.147	0.193	0.175	34	–4↓
Lakshadweep	0.000	0.333	0.219	0.003	0.168	0.188	0.168	0.173	0.147	35	–2↓
Nagaland	0.267	0.009	0.000	0.582	0.000	0.000	0.147	0.084	0.120	36	0↔

Considering each dimension of FIU independently, the PMJAY score shows that the major states such as Jharkhand, Arunachal Pradesh, Jammu-Kashmir, Andhra Pradesh, Chhattisgarh, Madhya Pradesh, Punjab, Tamil Nadu, Karnataka, Gujarat, Uttarakhand, and Rajasthan have implemented the health insurance schemes PMJAY very well (PMJAY score ≥ 0.5). Among the smaller states or union territories, Meghalaya, Ladakh, Mizoram, Nagaland, and Tripura have also done very well in implementing the scheme PMJAY. It is noted that the four states such as Odisha, West Bengal, New Delhi, and Telangana have not implemented the PMJAY schemes in the states. Other than Chandigarh, the states which have low PMJAY scores (PMJAY score ≤ 0.3) are Lakshadweep, Goa, Andaman-Nicobar, Maharashtra, Himachal Pradesh, Sikkim, Haryana, Dadra-Nagar-Haveli and Daman-Diu.

In the PMJJBY score, Telangana is on the top of the list followed by Mizoram, Goa, Karnataka, Chhattisgarh, Dadra-Nagar-Haveli and Daman-Diu, Sikkim, Tamil Nadu, Himachal Pradesh, Gujarat, New Delhi, Andhra Pradesh, Haryana with PMJJBY ≥ 0.50. Nagaland is the worst-performing state in terms of PMJJBY score followed by the states such as Manipur, Ladakh, Uttar Pradesh, Lakshadweep, Meghalaya, Bihar, Jharkhand, West Bengal, Jammu-Kashmir, Assam, Kerala, Punjab, and Chandigarh (PMJJBY ≤ 0.30).

In terms of PMSBY score, Chhattisgarh is outperformed (PMSBY ≥ 0.5) among all the states followed by Telangana, Himachal Pradesh, Uttarakhand, Andhra Pradesh, Punjab, Karnataka, Kerala, Goa, Tamil Nadu, Haryana, Odisha, and Madhya Pradesh. The states with low PMSBY scores (PMSBY ≤ 0.3) are Uttar Pradesh, Jharkhand, Bihar, Assam, Lakshadweep, Andaman-Nicobar, Jammu-Kashmir, Arunachal Pradesh, Manipur, Ladakh, Meghalaya, and Nagaland.

The pension scheme APY is not so popular as PMJJBY and PMSBY across states but considering the APY scores relatively, the five states with APY scores ≥ 0.5 are Sikkim, Dadra-Nagar-Haveli and Daman-Diu, Andhra Pradesh, Tamil Nadu, Himachal Pradesh, and Tripura. The states such as Mizoram, Jammu-Kashmir, Andaman-Nicobar, Meghalaya, Manipur, Nagaland, Lakshadweep, Arunachal Pradesh, Assam, Chandigarh, Kerala, Gujarat, Maharashtra, Chhattisgarh, Uttar Pradesh, and Rajasthan have underperformed states as far as implementation of APY is concerned APY score ≤ 0.30. The APY data for Ladakh was not captured yet so we have excluded the Ladakh from APY scoring.

5 Conclusions and policy implications

In the paper, a new universal financial inclusion index (FIU) covering banking, insurance, and pension parameters in India is developed, consistent with development indexes such as HDI, HPI, and GDI. FIU is compared to the Financial Inclusion index covering banking parameters only. The general view is that financial inclusion concentrates only on banking services and there is very lesser importance on the insurance and pension policies which are part of universal financial services. The universal financial inclusion index is useful for researchers and policymakers in India to understand all the dimensions of the financial inclusion status across states in India. In contrast to a banking indicator (Sarma, 2008) or financial access variable such as ease and cost of the transaction (Arora, 2010), this paper develops a universal financial inclusion index.

The results show that the state, with a high financial inclusion index, may not be necessary good in universal financial inclusion also. The best example of such a state is Kerala, which outperformed in banking services but underperformed in implementing insurance and pension schemes of the Government of India. On the contrary, states such as Telangana, Andhra Pradesh, Karnataka, Uttarakhand and Chhattisgarh have outperformed in universal financial services better than their banking services only. Nagaland is the only state, has scored the lowest in both kinds of banking and universal index.

The study has certain limitations. The focus of the study is on insurance and pension but the variables cover only PMSBY, PMJJBY, and APY were initiated by the Government of India but some of the schemes initiated by the state-level government are not covered. The policymakers can measure the universal financial inclusion index results objectively and design the specific provisions or privileges for the states with the low level of universal financial inclusion index. Some kind of prioritisation on financial education and awareness can be outlined for the states with the low level of insurance and pension' schemes implementation.

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Notes

1 Rural India has been traditionally housing three-fourths to four-fifths of India's poor (Niti Aayog, 2021).

2 https://pmjay.gov.in/states/states-glance.

3 https://dbie.rbi.org.in.