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A Nationwide Comparative Study on Financial Inclusion through PMJDY

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ABSTRACT
***Purpose** - Financial inclusion refers to the provision of affordable financial products and services to all members of society without any discrimination. 'Pradhan Mantri Jan-Dhan Yojana' is a government scheme to provide a zero-balance account to every citizen in India.*
***Methodology**- This study creates a financial inclusion index based on three dimensions: banking penetration, disbursement, and services. And distributed states as per their index score in three levels: high, middle, and low. There is a continuum from 0 (no inclusion) to 1 (complete inclusion).*
***Findings**- The study finds that six out of 37 states showed high progress in financial inclusion, 14 came under the middle level, and 17 went to the low level. Chhattisgarh scored high on in index, while Puducherry had the lowest score.*
***Originality**- This study will help the policymakers and regulators make the structural framework for low-inclusion states. This study may be unique in the field of evaluating the effectiveness of the PMJDY plan in states as per targeted population.*

***Keywords:** financial inclusion, fii, inverse euclidean distance, banking, states, pmjdy*
***JEL Classification:** G00, G21, G28.*

I. INTRODUCTION

Financial inclusion stands as a cornerstone in the edifice of economic progress and social equity. The notion signifies that all individuals, regardless of their socio-economic standing, should be able to avail themselves of essential financial services. The universal availability of banking and related services is not merely a convenience but a fundamental right, crucial for empowering individuals and fostering inclusive growth within a nation. As articulated by the eminent economist and former Governor of the Reserve Bank of India (RBI), C. Rangarajan, financial inclusion encompasses "the 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" (Rangarajan, 2008).

In the Indian context, the pursuit of financial inclusion has been a journey marked by significant strides and persistent challenges. The diversity and complexity of the Indian landscape present a unique set of obstacles to achieving comprehensive financial inclusion. Recognizing this imperative, the Reserve Bank of India (RBI) has embarked on a series of reforms and initiatives aimed at extending the reach of banking services to every corner of the nation. Among these initiatives, the Pradhan Mantri Jan Dhan Yojana (PMJDY), launched on August 28, 2014, stands out as a watershed moment in the quest for financial inclusion.

The PMJDY, envisioned as a comprehensive financial inclusion program, aimed to bridge the gap between the banking sector and the unbanked masses of India. The programme aimed to use technology and new legislative frameworks to give access to essential banking services, including as accounts for savings, pension schemes, credit facilities, and insurance, for the previously neglected parts of society. At its core, PMJDY aimed to democratize access to financial resources and empower millions of individuals with the tools necessary to participate actively in the formal economy.

The implementation of PMJDY heralded a new era in India's financial landscape, marked by unprecedented outreach and inclusivity. However, the success of any such initiative hinges not only on its intent but also on its efficacy in addressing the multifaceted challenges of financial exclusion. As such, it becomes imperative to undertake a comprehensive evaluation of the impact of PMJDY across different regions and demographic segments of the country.

This study endeavors to fill this critical gap by presenting a nationwide comparative analysis of financial inclusion through the prism of PMJDY. Through a meticulous examination of the dimensions of financial inclusion across 37 states of India, this study seeks to unravel the intricacies of inclusive banking and assess the efficacy of existing policies and interventions. By employing a three-dimensional Financial Inclusion Index (FII), The objective of this study is to clearly define

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the varied levels of financial inclusion that exist in various states and pinpoint specific areas where focused intervention and policy reform are needed.

The three dimensions of financial inclusion considered in this study encompass access to banking services, availability of credit facilities, and affordability of financial products. This study aims to analyse and examine the various aspects of financial inclusion in India in order to gain a detailed understanding. It also seeks to provide valuable insights into the reasons that contribute to the differences in access and participation.

Preliminary findings suggest a landscape characterized by stark regional disparities, with certain states emerging as trailblazers in the journey towards financial inclusion, while others lag behind. It is evident that while PMJDY has made significant inroads in expanding access to banking services, there remains a pressing need for a concerted effort to address the underlying structural barriers that impede the full realization of financial inclusion goals. this study underscores the imperative of a holistic and multi-dimensional approach to financial inclusion, one that goes beyond mere access to banking services to address the underlying socio-economic factors perpetuating exclusion. As we navigate the complexities of inclusive banking in India, it becomes increasingly clear that a robust policy framework, coupled with targeted interventions and technological innovations, is essential to ushering in an era of truly inclusive growth and prosperity for all.

II. REVIEW OF LITERATURE

The review of literature for delves into an extensive array of national and international research that employs the Financial Inclusion Index (FII) as a key analytical tool. The authors meticulously examine studies that elucidate various dimensions of financial inclusion, such as accessibility, usage, and the quality of financial services. At the national level, research highlights the transformative impact of initiatives like PMJDY on enhancing banking outreach among marginalized populations in India, drawing attention to the disparities in financial access across different states. Internationally, the literature underscores comparative analyses of financial inclusion efforts in diverse socio-economic contexts, providing insights into best practices and challenges faced by other developing economies. These analyses emphasise the complex and diverse aspects of financial inclusion and the crucial importance of specific policy interventions in closing the gap in financial access. By synthesizing findings from a broad spectrum of research, the review underscores the importance of a nuanced, multi-dimensional approach to assessing and promoting financial inclusion.

Studies Related to Global Aspects using the Same Index

The most notable research on this topic was conducted by Sarma in 2008. Sarma built a Financial Inclusion Index (FII) using data from multiple countries, applying a framework provided by the United Nations Development Programme (UNDP). This extensive study included 55 countries using a three-dimensional model and 100 countries using a two-dimensional model to evaluate financial inclusion. In conclusion, Spain emerged as the top scorer among the countries studied, outperforming others in the index (Sarma, 2008).

Additionally, Sarma explored the same topic in another study but used different weights for the variables, resulting in a newly constructed FII. This subsequent research analyzed data from the year 2004 and included 47 countries. The findings revealed a diverse range of financial inclusion levels: thirteen countries exhibited high FII values, ten countries had moderate values, and the remaining twenty-four countries demonstrated poor FII levels (Sarma, 2012).

Expanding on Sarma's methodology, three specific metrics were developed, which were then used in a study to construct a regional FII for Turkey. The primary findings of this study indicated significant regional disparities in financial inclusion within the country. Among the regions of Turkey, Istanbul achieved the highest FII value, indicating a superior level of financial inclusion, whereas Eastern Anatolia was found to have the lowest FII value, reflecting significant challenges in financial inclusion in that region (YORULMAZ, 2013). This comprehensive analysis underscores the importance of regional strategies in addressing financial inclusion disparities.

- **Studies Related to the Global Aspect using Another Index**

A study conducted by Piñeyro created a multi-dimensional Financial Inclusion Index (FII) for Mexican municipalities using Principal Component Analysis (PCA). The study classified the municipalities into three categories based on their FII scores: 884 municipalities were identified as having high financial inclusion, 848 were categorized as having medium financial inclusion, and 724 were determined to have low financial inclusion (Piñeyro, 2013). This comprehensive approach provided valuable insights into the varying levels of financial inclusion across Mexico, highlighting significant disparities among different regions.

In another significant study, Camara and David (2014) also employed Principal Component Analysis to generate an FII, but their analysis encompassed 82 developed and developing nations in the year 2011. According to their research, South Korea was placed as the top country out of the 82 countries investigated, indicating the highest degree of financial inclusion. On the other hand, the nation of the Democratic Republic of the Congo (DRC) was ranked last, indicating the lowest level of

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financial inclusion among the countries analysed (Cámara & Tuesta, 2014). This global perspective underscored the wide range of financial inclusion levels across different countries and emphasized the need for targeted policies to address these disparities.

- **Studies Related to Domestic Aspects using the Same Index**

Chakravarty & Pal (2010) employed the financial inclusion measures developed by Beck et al., (2007) to examine the Indian economy. Their study found that any banking indicator, such as the number of bank branches or the volume of credit, can significantly promote financial inclusion (S. R. Chakravarty & Pal, 2013). This highlights the multifaceted nature of financial inclusion and the various ways it can be enhanced through different banking activities.

In another study, Yadav et al. utilized Sarma's Financial Inclusion Index with dimension weights attached to both demand and supply factors to reach their conclusions. Their research showed a slight but steady progress in financial inclusion in India from 2004 to 2017. Specifically, the mean FII for supply factors increased from 0.266 in 2004 to 0.302 in 2017, while the mean FII for demand factors rose from 0.237 to 0.279 during the same period. However, the study also highlighted the persistent issue of poor financial inclusion in the northern and northeastern regions of India. It was found that financially stable states tended to have higher Human Development Index (HDI) scores and better literacy rates (Yadav et al., 2021).

Chattopadhyay's (2011) research focused on district-level financial inclusion in West Bengal, India, providing a detailed analysis of how financial inclusion varies within smaller administrative units (Chattopadhyay, 2011). This localized approach is crucial for understanding and addressing specific regional challenges.

- **Studies Related to the Domestic Aspect using Another Index**

Using Principal Component Analysis (PCA), Bagli & Dutta (2012) produced Financial Inclusion Indexes (FIIs) for twenty-eight states in India. Based on their research, Goa achieved an excellent aggregate FII score of 144.25, which signifies a significant degree of financial inclusion in the state. In contrast, Manipur had the lowest composite FII score of 67.6, reflecting significant challenges in achieving financial inclusion (Bagli & Dutta, 2012). This study provided valuable insights into the disparities in financial inclusion across various Indian states, highlighting the regions that require more focused efforts and resources to enhance financial services access.

To find out how well India's public sector banks were doing before and after the Pradhan Mantri Jan Dhan Yojana (PMJDY) programme, which aimed to broaden access to banking services, Maity & Sahu (2020) compared the two sets of data. Their research aimed to assess whether the PMJDY program had a significant impact on the performance of public sector banks in terms of promoting financial inclusion. By analyzing various performance indicators, Maity and Sahu sought to determine the program's success in enhancing the reach and quality of financial services provided by these banks (Maity & Sahu, 2020). This study is critical as it sheds light on the effectiveness of government initiatives in driving financial inclusion and improving the overall financial ecosystem in India.

III. THE OBJECTIVE OF THE STUDY

Using the 'Pradhan Mantri Jan Dhan Yojana' (PMJDY) as a foundation, this study aims to gather information on the Financial Inclusion Index (FII) at the state level for the intended beneficiaries. In order to assess the effect of the PMJDY programme on financial inclusion in various Indian states, this study will collect and analyse data in a systematic way. By focusing on state-level data, the study seeks to provide detailed insights into how effectively the PMJDY initiative has been implemented and its success in increasing financial access and inclusion for various segments of the population.

IV. METHODOLOGY

In this study, a multidimensional approach is used to develop an appropriate financial inclusion index. This index is the same as Sarma's suggested FII index (Sarma, 2008). The suggested FII ranges from 0 to 1, with 0 being the most limited level of financial inclusion or total financial exclusion and 1 being the highest level of financial inclusion. In this study, FII is calculated after calculating each index by the formula (1).

$$D_i = \frac{A_i - m_i}{M_i - m_i} \qquad (1)$$

Di Dimension index for the ith dimension.
Ai Actual value for the ith dimension.
Mi Maximum value for the ith dimension.
mi Minimum value for the ith dimension.

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Formula (1) represents $0 \leq D_i \leq 1$, higher D_i means higher inclusion in the i^{th} dimension. If the n dimension is considered, the D_i will be defined in the n-dimensional Cartesian space as - $D_i = (d1, d2, d3, \ldots dn)$.

In this study, the total beneficiaries under PMJDY, the amount available in the accounts, and the Rupay debit cards issued to beneficiaries are compared with the estimated population chosen to represent as the i^{th} dimensions (d_1, d_2, d_3) in the Cartesian three-dimensional space, where $0 \leq d_1, d_2, d_3 \leq 1$. In three-dimensional Cartesian space, the worst possible scenario is complete financial exclusion at the (0,0,0) point, while the best possible scenario is located at the (1,1,1) point of complete financial inclusion. The FII for the i^{th} state, Then, it is the normalized inverse Euclidean distance from D_i to the reference point I= (1,1, 1,…1) that is used to determine. the precise formula is –

$$FII = 1 - \frac{\sqrt{(1 - D_1) + (1 - D_2) + (1 - D_3)}}{\sqrt{3}} \qquad 2$$

In formula (2), the numerator of the second component is the Euclidean distance between D_i and the ideal point I. Normalizing it divided by $\sqrt{3}$ (n=3, i.e., $\sqrt{n} = \sqrt{3}$) and for the inverse result, researchers subtract from 1. Values are normalized so that they range from 0 to 1. A higher FII score indicates a more financially inclusive society due to the inverse distance. States are divided into three categories based on their FII value, i.e.

1	$0.67 < FII \leq 1$	high financial inclusion
2	$0.33 < FII \leq 0.67$	medium financial inclusion
3	$0 < FII \leq 0.33$	low financial inclusion.

V. DATA

Source of Data

The research relies exclusively on secondary resources for its data collection. The researchers gathered the necessary information from the official ‘Pradhan Mantri Jan Dhan Yojana’ (PMJDY) website. By utilizing this centralized and authoritative source, the study ensures that the data is accurate, up-to-date, and reflective of the official records maintained by the PMJDY program. When evaluating the Financial Inclusion Index (FII) on a state level, the data retrieved from the PMJDY website contains a number of critical variables. Various metrics can be used to measure the program's impact on financial inclusion, such as the number of bank accounts opened through the PMJDY scheme, the amount and frequency of financial transactions, the accessibility of banking services in rural versus urban regions, and other pertinent data.

Using these secondary data resources allows the researchers to compile a comprehensive and detailed database. This approach ensures that the research is grounded in reliable and standardized data, facilitating a more accurate analysis of the state-level financial inclusion landscape. Research intends to shed light on the PMJDY program's efficacy in improving financial inclusion across Indian states by concentrating on data from the PMJDY website. This will help identify areas of success as well as regions where additional efforts are needed to improve financial access and inclusion for the targeted population.

Data Frame for the Study

The study uses the data on state-wise account opening PMJDY reports as of 07/12/2022 [Table 1] (Pradhan Mantri Jan-Dhan Yojana, 2022). As per the report, thirty-seven states are there, and around 47.63 crores beneficiaries have access to bank accounts under this scheme. Currently, ₹ 177,625.21 crores balance in the beneficiaries’ accounts and 32.44 crores Rupay card already distributed between the account holder. PSBs hold the majority of the beneficiaries’ accounts, around 37.50 crores.

Estimated Population- The PMJDY scheme is available for only a particular age group between 18-59 years. Referenced above are numbers from the National Commission on Population (2020)’s "Census of India 2011 Population Projections for India and States 2011-2036" research. For 2022 estimated population researchers calculate using an estimated growth rate (0.68%) from United Nations projections. And from the report on population projections find the average percentage (60%) for a particular age group.

$$\textit{Estimated Population}_{18-59,2022} = (\textit{Population}_{2021} \times 1.0068)\ 0.60 \qquad 3$$

Where:

- Population_{2021} is the population estimate for the year 2021.
- 1.0068 accounts for the 0.68% increase in population from 2021 to 2022.
- 0.60 represents the proportion of the population within the age range of 18-59 years.

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Table 1: State wise data and estimated population on 2022

State Name	Total Beneficiaries	Balance in beneficiary Amount (in crore)	No. of Rupay Cards Issued to Beneficiaries	Estimated population (18-59 years) *
Andaman & Nicobar Islands	47046	31.93	37259	111180
Andhra Pradesh	12789548	3830.5	8838071	15501300
Arunachal Pradesh	395067	202.8	311814	427080
Assam	21679517	5638.37	11576966	9818100
Bihar	53614880	18455.3	39394618	33045000
Chandigarh	301941	152.13	189906	311700
Chhattisgarh	16481849	5089.83	10436778	8298840
Dadra & Nagar Haveli	155183	95.11	96645	114780
Daman & Diu	63898	32.17	47220	68280
Delhi	5717079	2447.54	4202383	5253660
Goa	187496	157.53	116331	451860
Gujarat	17334053	7917.45	12975223	18779040
Haryana	8977193	5090.5	6011906	7774500
Himachal Pradesh	1691072	1196.19	1177221	2131200
Jammu & Kashmir	2614271	1643.74	1882645	3689700
Jharkhand	17033431	6250.29	11481526	10534560
Karnataka	17117252	6716.03	9981221	19125780
Kerala	5361981	2341.11	2974410	10863780
Ladakh	20919	24.41	18421	75540
Lakshadweep	10107	16.64	4791	19320
Madhya Pradesh	39062308	9578.12	29659287	22996740
Maharashtra	32280246	11136.65	22106747	34479660
Manipur	1050758	239.28	672718	904320
Meghalaya	656701	367.6	442529	941160
Mizoram	316547	141.06	126074	345540
Nagaland	358919	98.43	296241	608280
Odisha	19551845	7669.34	14247144	13161120
Puducherry	182949	86.61	122487	436140
Punjab	8240108	3780.87	5807001	8332080
Rajasthan	32715482	14176.87	24368700	21680460
Sikkim	87067	51.82	60304	183660
Tamil Nadu	13451292	4521.11	9386492	22528560
Telangana	10597155	3051.93	8310622	10943520
Tripura	939395	442.36	337142	1147740
Uttar Pradesh	85292041	35985.24	55671137	62388180
Uttarakhand	3090428	1829.56	2127458	3176280
West Bengal	46863315	17138.79	28945070	28043220

Table 1 source-(*Pradhan Mantri Jan-Dhan Yojana | Department of Financial Services | Ministry of Finance*, 2022)
*Calculated using formula 3.

VI. ANALYSIS

Financial Inclusion Index (IFI) through PMJDY

To measure the extent to which financial inclusion has advanced, researchers utilised PMJDY state-wise reports to develop the Financial Inclusion Index (FII). The study used indicators including banking service availability, banking penetration, and banking disbursement to evaluate a country's financial development. Ideally, a single score would capture data from several ways financial inclusion may be measured. This indicator can be utilised to assess the degree of financial inclusion among different Indian states over time. In addition, this type of metric can provide solutions to issues brought up in the growing body of research on financial inclusion. Three dimensions are included in the studies as follows [Table 2], -

- **Banking Penetration -** The goal of creating a financially inclusive system is to have as many people as possible using it or to have a high adoption rate. The degree of penetration of banking can be assessed by examining the magnitude of the "banked" populace or the quantity of individuals possessing bank accounts. Therefore, in the scenario where each individual possesses a bank account, the designated amount would be 1. According to the report, 31.74 crores of beneficiaries have access in the rural/semi-urban sector, whereas 15.82 crores have access in metro cities. In this study, researchers considered the total beneficiaries under the PMJDY scheme compared with the estimated population (18-59 years of age) as banking penetration.
- **Banking Disbursement -** The amount in the bank account is the indication that develops in millions of individuals the routine of using banks and joining the financial system. The amount available in the beneficiaries' account is around ₹ 177,625.21 crores. PSBs hold the bulk with 13,687068.64 crores, RRBs with 3487713.09 crores, and private banks with 516454.39 crores. In this study, the amount available in the accounts compared with the estimated population (18-59 years of age) is considered banking disbursement.
- **Banking Services -** The financial services provided by a fair and equitable system should be easy to access. In today's digital world, a debit card has far more applications than services from an ATM. So, researchers consider the proportion of beneficiaries were issued Rupay debit cards compared with the estimated population (18-59 years of age) as the banking service. Out of 32,4314492 crores distributed Rupay cards, PSBs issued 279067715 crores.

Table 2: Calculation of Dimensions

State Name	Banking penetration	Banking disbursement	Banking Services	D1	D2	D3
Andaman & Nicobar Islands	42315.1646	28.7191941	33512.32236	0.075717781	0.179243717	0.087263794
Andhra Pradesh	82506.29302	24.7108307	57015.031	0.283833518	0.121937726	0.311985274
Arunachal Pradesh	92504.21467	47.48524867	73010.67716	0.335604267	0.447534604	0.464927871
Assam	220811.7355	57.42832116	117914.5252	1	0.589686793	0.894276647
Bihar	162248.0859	55.8489938	119215.0643	0.696748572	0.567107772	0.90671177
Chandigarh	96869.10491	48.80654475	60925.89028	0.358206328	0.466424653	0.34937901
Chhattisgarh	198604.2507	61.33182469	125761.8896	0.885006288	0.645493644	0.969309333
Dadra & Nagar Haveli	135200.3833	82.8628681	84200.2091	0.556691481	0.953314486	0.571916738
Daman & Diu	93582.30814	47.11482132	69156.41476	0.341186798	0.44223875	0.428075286
Delhi	108820.8792	46.5873315	79989.62628	0.420094422	0.434697436	0.531657191
Goa	41494.26814	34.86256805	25744.92099	0.071467055	0.267073114	0.012995676
Gujarat	92305.32019	42.16110089	69094.17627	0.334574361	0.371417361	0.427480192

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Haryana	115469.7151	65.47687954	77328.52273	0.454523099	0.70475386	0.506213012
Himachal Pradesh	79348.34835	56.12753378	55237.47185	0.267481203	0.571089948	0.294989117
Jammu & Kashmir	70853.213	44.54942136	51024.33802	0.223492108	0.405562238	0.254705179
Jharkhand	161690.9581	59.33128674	108989.1367	0.69386368	0.616892742	0.808936419
Karnataka	89498.32111	35.11506459	52187.26243	0.320039296	0.270682957	0.265824497
Kerala	49356.4947	21.5496816	27379.14428	0.112178852	0.076744023	0.028621325
Ladakh	27692.61319	32.31400582	24385.75589	0	0.230637324	0
Lakshadweep	52313.6646	86.12836439	24798.13665	0.127491525	1	0.003942984
Madhya Pradesh	169860.1976	41.64990342	128971.7021	0.736165237	0.364108972	1
Maharashtra	93621.12619	32.2991874	64115.3277	0.341387804	0.230425471	0.379874861
Manipur	116193.1617	26.4596603	74389.37544	0.458269215	0.146940053	0.478110314
Meghalaya	69775.70232	39.05818352	47019.52909	0.217912595	0.327056174	0.216413142
Mizoram	91609.36505	40.82305956	36486.07976	0.3309706	0.352287912	0.115697417
Nagaland	59005.55665	16.18169264	48701.4204	0.162143153	0	0.232494569
Odisha	148557.6076	58.2727002	108251.7597	0.625857206	0.601758547	0.801885979
Puducherry	41947.3105	19.85830238	28084.33072	0.073812977	0.05256304	0.035363975
Punjab	98896.16998	45.37726474	69694.49405	0.368702778	0.417397588	0.433220139
Rajasthan	150898.468	65.39007936	112399.3679	0.637978536	0.703512912	0.841543393
Sikkim	47406.62093	28.21518022	32834.58565	0.102082111	0.17203803	0.080783605
Tamil Nadu	59707.73099	20.0683488	41664.85563	0.165779118	0.055565991	0.165214356
Telangana	96834.97631	27.88801044	75941.03177	0.358029605	0.167360612	0.492946498
Tripura	81847.36961	38.54183003	29374.42278	0.280421513	0.319674072	0.047699209
Uttar Pradesh	136711.8595	57.67957969	89233.46858	0.564518133	0.593278937	0.62004232
Uttarakhand	97297.08968	57.6007153	66979.5484	0.360422498	0.592151444	0.407261148
West Bengal	167111.0343	61.11562795	103215.9288	0.721929654	0.642402765	0.753735811

Source: Authors' calculation

In table 2, In the data 37sates' dimensions reports are calculated. D_1, D_2, and D_3 are computed using equation (1). In $D_{1,}$ Assam has the higher banked population, and Ladakh has lower bank penetration. In Banking disbursement (D_2), Lakshadweep has better banking disbursement, and Nagaland has inadequate banking disbursement. For Banking Services (D_3), Madhya Pradesh shows higher than others, and Ladakh offers the lower among others. Figure 1 shows the dimensions in a line graph.

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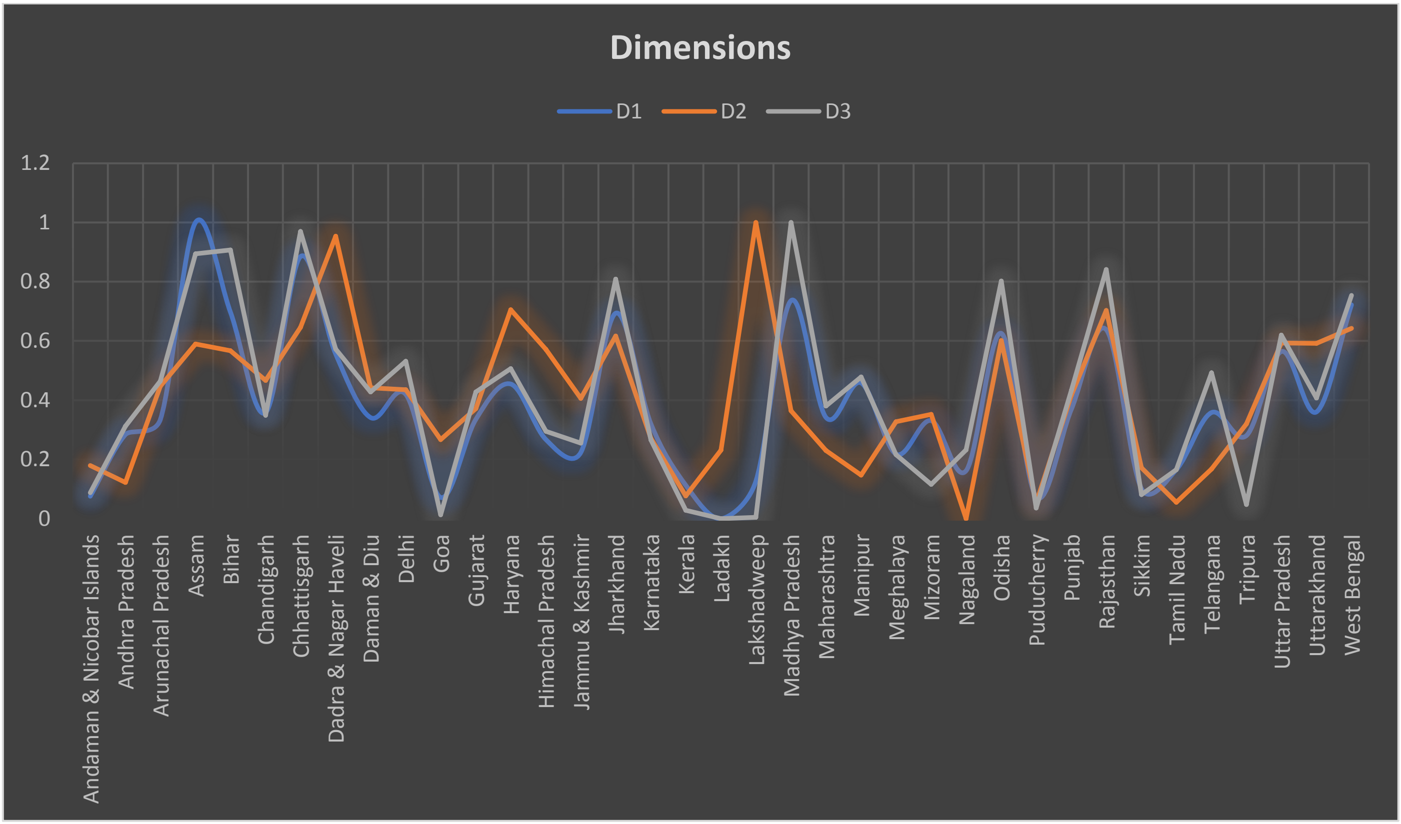
Figure 1: Graphical representation of dimensions



Source: Authors' depiction

Table 3: State wise Financial Inclusion Index and Ranks

State Name	FII	RANK
Andaman & Nicobar Islands	0.1128649	33
Andhra Pradesh	0.2346565	28
Arunachal Pradesh	0.4132173	14
Assam	0.7553681	2
Bihar	0.6901292	6
Chandigarh	0.3890146	17
Chhattisgarh	0.7840986	1
Dadra & Nagar Haveli	0.643182	8
Daman & Diu	0.4021621	16
Delhi	0.4598758	12
Goa	0.1105184	34
Gujarat	0.3766525	18
Haryana	0.5422734	11
Himachal Pradesh	0.3629265	19
Jammu & Kashmir	0.2901209	23
Jharkhand	0.6961382	5
Karnataka	0.2850959	24
Kerala	0.0718828	35
Ladakh	0.0704985	36
Lakshadweep	0.2354957	27
Madhya Pradesh	0.602522	9

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Maharashtra	0.3142959	22
Manipur	0.3433539	20
Meghalaya	0.2519977	26
Mizoram	0.2585774	25
Nagaland	0.1261067	31
Odisha	0.6644267	7
Puducherry	0.0537826	37
Punjab	0.4058055	15
Rajasthan	0.7147676	3
Sikkim	0.11744	32
Tamil Nadu	0.1273131	30
Telangana	0.3260768	21
Tripura	0.2067969	29
Uttar Pradesh	0.5919827	10
Uttarakhand	0.4442005	13
West Bengal	0.7023173	4

Source: Authors' calculation

Table 3 is calculated using equation (2). Researchers compared 37 states and concluded that Chhattisgarh (with an inclusion rate of 0.7840986) was the most inclusive, followed by Assam (0.7553681), Rajasthan (0.7147676), West Bengal (0.7023173), Jharkhand (0.6961382) and Bihar (0.6901292). The FII values for the remaining states range from 0.67 to 0. Puducherry ranks lowest with an FII of 0.0537826.
After the computation of FII, 37 states are divided into three categories [Table 4]-

Table 4: Level of Financial Inclusion

High level of financial inclusion	Middle level of financial inclusion	Low level of financial inclusion
• Chhattisgarh	• Odisha	• Telangana
• Assam	• Dadra & Nagar Haveli	• Maharashtra
• Rajasthan	• Madhya Pradesh	• Jammu & Kashmir
• West Bengal	• Uttar Pradesh	• Karnataka
• Jharkhand	• Haryana	• Mizoram
• Bihar	• Delhi	• Meghalaya
	• Uttarakhand	• Lakshadweep
	• Arunachal Pradesh	• Andhra Pradesh
	• Punjab	• Tripura
	• Daman & Diu	• Tamil Nadu
	• Chandigarh	• Nagaland
	• Gujarat	• Sikkim
	• Himachal Pradesh	• Andaman & Nicobar Islands
	• Manipur	• Goa
		• Kerala
		• Ladakh
		• Puducherry

Source: Authors' calculation

VII. FINDINGS

Data from indices of banking penetration, banking disbursement, and banking service were used to calculate the Financial Inclusion Index for 37 states. States are ranked as having a "High," "Middle," or "Low" level of financial inclusion

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based on the index's range. Chhattisgarh has the highest FII score, while Puducherry has the lowest. There are three tiers of inclusion, with six states included at the highest level, fourteen at the medium, and seventeen at the lowest.

Data from various indices, including banking penetration, banking disbursement, and banking service, were meticulously analyzed to compute the Financial Inclusion Index (FII) for a total of 37 states. These indices served as key metrics in assessing the extent to which each state provided inclusive financial services to its population. By leveraging this multifaceted approach, the researchers aimed to capture a comprehensive picture of financial inclusion across different regions. Upon calculation, the states were categorized into three distinct tiers of financial inclusion: "High," "Middle," and "Low," based on the range of their FII scores. This tiered classification system enabled a nuanced understanding of the varying degrees of financial inclusion prevalent across the states under examination.

At the apex of the hierarchy, Chhattisgarh emerged with the highest FII score, indicative of its exemplary performance in fostering financial inclusion initiatives and ensuring widespread access to banking services among its residents. Conversely, Puducherry found itself at the opposite end of the table, possessing the lowest FII score among the states analyzed, signifying significant challenges in achieving comprehensive financial inclusion within its jurisdiction. The analysis further revealed a distribution of states across the three tiers of inclusion. Notably, six states were distinguished for their exceptional performance, earning them a place in the "High" tier of financial inclusion. Fourteen states fell within the "Middle" tier, demonstrating a moderate level of financial inclusion, while seventeen states were classified in the "Low" tier, indicating a considerable need for improvement in their financial inclusion efforts.

These tiered categorizations reveal the various landscapes of financial inclusion initiatives throughout the states, highlighting successes and areas for improvement. Such detailed assessments serve as valuable resources for policymakers, financial institutions, and development practitioners seeking to design and implement effective strategies to enhance financial inclusion and promote economic empowerment at the state level.

VIII. LIMITATIONS OF THIS INDEX

The presented index has some restrictions, primarily because of insufficient information. Estimated data were also used to create results for this measure because India has not conducted a census since 2011. In light of this, it's clear that estimates based on publicly available data and a growth rate of 0.68% and age group data will not be comparable across states.

IX. POLICYMAKERS

Policymakers, both at the regional and national levels, wield significant influence in assessing and promoting financial inclusion within their respective jurisdictions. The Financial Inclusion Index (FII) serves as a powerful tool for these policymakers, providing a structured framework to independently evaluate the degree of financial inclusion across different regions.

The FII is built upon three fundamental pillars, each accorded equal weight in the assessment process. These pillars encompass various aspects of financial access, including banking penetration, banking disbursement, and the availability of banking services. By incorporating these dimensions, the index offers a holistic perspective on the state of financial inclusion within a given region.

Armed with the insights garnered from the FII, policymakers can effectively pinpoint regions that are lagging behind in terms of financial inclusion. These "off-limits" areas represent pockets of exclusion where concerted efforts are needed to bridge the gap and ensure equitable access to financial services for all segments of the population. With this targeted understanding, policymakers can devise tailored intervention plans aimed at addressing the specific needs and challenges faced by each exclusion area.

Furthermore, the FII empowers policymakers to make informed decisions regarding resource allocation. By identifying regions with lower FII scores, policymakers can allocate resources strategically, directing investments and initiatives towards areas where they are most needed. This targeted approach maximizes the impact of interventions, ensuring that limited resources are utilized efficiently to drive meaningful progress in advancing financial inclusion goals.

Overall, the FII serves as a valuable instrument for policymakers, enabling them to assess, strategize, and allocate resources effectively to promote inclusive financial development at both the regional and national levels. By utilising the knowledge offered by this index, policymakers can strive to establish a financial ecosystem that is both inclusive and resilient, benefiting all individuals irrespective of their geographic location or socio-economic standing.

X. BANKS AND REGULATORS

The adoption of this measure will provide banks with a valuable tool to assess the effectiveness of their financial inclusion strategies across diverse geographic regions. By leveraging the insights derived from the Financial Inclusion Index (FII), banks can gain a comprehensive understanding of how well their initiatives are performing in various areas. This analysis enables banks to identify strengths and weaknesses in their approach and tailor their strategies to better meet the needs of different communities. Furthermore, regulators can utilize the FII to adopt a more nuanced approach to addressing financial exclusion. By leveraging the indicators included in the index, regulators can develop targeted interventions aimed at expanding access to financial services for underserved populations. This may involve implementing policies and initiatives that specifically target areas with low FII scores, thereby addressing the root causes of financial exclusion and promoting greater financial inclusion across the board. In addition, the FII can serve as the foundation for the development of an information system focused on expanding access to financial services for underserved populations. By incorporating the indicators included in the index into this system, regulators can track progress over time, identify emerging trends, and measure the impact of various interventions. This data-driven approach allows regulators to make informed decisions and allocate resources effectively to maximize the impact of their efforts.

Overall, the adoption of the FII represents a significant step forward in promoting financial inclusion and addressing the needs of underserved populations. By providing banks and regulators with valuable insights and tools, the FII empowers stakeholders to take targeted action to expand access to financial services and promote greater financial inclusion for all.

XI. CONCLUSION

Financial inclusion entails expanding the availability of traditional financial services to individuals who were previously marginalised and unable to use services. PMJDY offers the Government an excellent opportunity to expand the availability of financial services. This study suggested a multi-dimensional FII comparable to the UNDP’s HDI indicator. The FII values determined for each of India’s 37 states as of 2022, as seen there is a wide range of financial inclusion throughout India. In this paper, researchers provide an example of an FII calculation using the most up-to-date information. The proposed Financial Inclusion Index (FII) included of three aspects: banking penetration, disbursement, and services. These aspects were evaluated in relation to the anticipated population aged 18 to 59, which had not been considered in previous studies. Find that six states are doing very well in the case of PMJDY, and others are under middle or low-level inclusion.

Nonetheless, appropriate innovation and the introduction of various technologies that function as facilitators and business correspondents are solutions to the problem of financial exclusion, as a large number of the rural poor are unable to obtain financial facilities, despite the proliferation of branches. Policymakers, planners, and Government still need help ensuring rural populations’ financial inclusion for inclusive growth.

Financial inclusion is the act of providing previously marginalised populations with access to conventional banking services. It is an essential aspect of socio-economic development. The ‘Pradhan Mantri Jan Dhan Yojana’ (PMJDY) presents a significant opportunity for the government to enhance the availability of financial services and promote inclusive growth. This study presents a multi-dimensional Financial Inclusion Index (FII) similar to the 'United Nations Development Programme's Human Development Index' (HDI), which provides a thorough evaluation of financial inclusion levels in all 37 states of India as of 2022. This paper's FII calculation encompasses three key dimensions related to financial inclusion: the distribution of financial resources, the extent of banking penetration, and the availability of financial services. Notably, this study introduces a novel approach by comparing these dimensions to the estimated population aged 18 to 59, a demographic segment not previously considered in similar analyses. The findings reveal a wide spectrum of financial inclusion across India, with some states excelling under the PMJDY initiative while others lag behind at middle or low levels of inclusion.

To address these disparities and promote more equitable access to financial services, structural adjustments within the policy framework are imperative. Specifically, there is a need for policies that facilitate the provision of essential services and financial products to the most economically vulnerable segments of society, potentially at minimal or no cost. This targeted approach aims to improve overall economic outcomes and foster inclusive growth.

Moreover, the study emphasises the significance of innovation and technology in tackling the obstacles of financial exclusion, especially in rural regions where the availability of conventional banking infrastructure may be restricted. Innovations such as mobile banking and business correspondent models can serve as effective mechanisms for reaching underserved populations and extending financial services to remote areas. In conclusion, policymakers, planners, and government agencies must prioritize efforts to ensure the financial inclusion of rural populations to foster inclusive growth and sustainable development. By implementing targeted policies, embracing innovative solutions, and leveraging technology, stakeholders can work towards building a more inclusive financial ecosystem that benefits all segments of society.

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SCOPE FOR FUTURE RESEARCH

The index can be used as a measure of financial inclusion at the district or lower levels. It is also applicable to other developing nations. The lack of available data could have influenced the researchers' evaluation. Future research will benefit greatly from having access to population data once they have been made public.

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