

# Impact Assessment of Pradhan Mantri Jan Dhan Yojana (PMJDY): A State-Level Analysis

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DOI: <https://doi.org/10.51244/IJRSI.2026.1306000123>

Received: 04 June 2026; Accepted: 09 June 2026; Published: 25 June 2026

## ABSTRACT

PMJDY is a significant flagship initiative aimed at promoting financial inclusion in India. This scheme aims to provide universal access to banking services. The existing study was conducted due to the inadequate research on the performance of BIMARU states in India, in terms of financial inclusion (FI). Most of the literature discussed the comparison of Financial Inclusion Index methods and mentioned the performance of financial inclusion in southern, central and western states. Using the Euclidean method for Financial Inclusion Index, the current research analyses the state-wise performance of PMJDY using secondary data on four variables, such as accounts per 1000 people, debit cards per household, accounts per household, and DBT amount per household. The findings show that the north-central states have performed better in financial inclusion under the PMJDY scheme as compared to other states and come under the high financial inclusion category. In 2020, eleven states were categorised as having high financial inclusion, but in 2023, this number decreased to nine. The Wilcoxon Signed-Rank test is used to measure whether the changes in FII between 2020 and 2023 are statistically significant. The policymaker needs to focus on some states that have performed well in financial inclusion and promote opening accounts and usage.

**Keywords:** PMJDY, Financial inclusion, BIMARU states, Euclidean method, Financial Inclusion Index.

## INTRODUCTION

For the development of all types of countries, financial inclusion plays a central part. It is providing the financial services at reasonable prices to the deprived, marginalised and low-income groups of the population. RBI and the Govt. of India (GOI) have implemented many schemes towards financial inclusion since 2005, such as expansion of bank branches, state-wise lending, etc. (PMJDY Brochure). According to the Scottish Executive (2005), Financial inclusion defines “access for individuals to appropriate financial products and services. This includes people having the skills, knowledge and understanding to make best use of those products and services”. (Anand S. Kodan,2013) According to C. Rangarajan (2008), financial inclusion refers to ‘the process ensuring access to financial services and timely adequate credit where needed by vulnerable groups such as the weaker section and low- income groups at an affordable cost’. (Garima Jain, 2017)

Financial inclusion (FI) has become a key area of focus in the global development agenda, aiming to ensure that businesses and individuals, especially those in marginalised and underserved communities, can access affordable and appropriate financial products and services. It helps boost the economy, fight poverty, and ensure inclusive growth in India. Launched by Prime Minister Sri Narendra Modi in 2014, PMJDY is the largest financial inclusion scheme in India, planned to provide access to financial services to all citizens, especially those who have historically been excluded from the banking system. PMJDY was launched on 28<sup>th</sup> August 2014 by the Government of India. The scheme aims to achieve universal banking access, ensuring that every household in the country possesses at least one basic banking account. A zero- balance savings account can be opened under this scheme with benefits such as Rupay debit card, overdraft facility, direct benefit transfer (DBT), accidental insurance cover, etc., for Govt. subsidiaries. (PMJDY Brochure)

In reference to Bihar, Madhya Pradesh (MP), Rajasthan and Uttar Pradesh (UP), the word "BIMARU" is used to describe a group of states in north-central India that face constant socio-economic challenges. These states struggled with high levels of poverty, low literacy, inadequate infrastructure and lack of access to banking services. (Kalyan Sunder som,2014) As a result, they lag in terms of FI.

The PMJDY, as part of the government's comprehensive FI strategy, aims to provide balanced non-cash accounts, promote digital banking, and provide insurance, pension and other financial products to underserved people; thus, the program empowers individuals living in these communities, especially in rural and remote areas, to improve their socio-economic status.

Most of the studies were directed to compute the status of financial inclusion (FI). But the present study drives a step forward by raising a financial inclusion index (FII) among 28 states of India and plans new metrics for the calculation of the financial inclusion index, such as accounts per 1000 people, debit cards per household, accounts per household, and DBT amount per household.

## LITERATURE REVIEW

Susanta Kumar Sethy (2018) used secondary data and the financial inclusion index (FII) to investigate the financial inclusion (FI) of Indian states. During the period of 2006-2014, no Indian state had high financial inclusion, according to the study, which used a regression model with three indicators. Vishal Y. et al. (2018) employed a district-by-district index for the years 2014–2018 in 27 Indian states. The findings indicated that, compared to other districts with three dimensions, the western and southern districts did better in terms of FI.

Loan Thi-Hong Van et al. (2019), in this study, the researcher used the panel econometric technique to estimate the result of FI on economic growth by a multidimensional index. The results supported that a strong positive connection exists between economic growth and financial inclusion in low-income countries.

Vishal Y. et al. (2020) looked at a three-indicator district-level financial inclusion index (FII) for the years 2011–2018. According to this study, the majority of Indian regions were classified as having low financial inclusion, with the South performing better and the central, eastern, and northeastern regions performing worse.

Kamal Sai Sadharma Erra et al. (2020), this study aimed to determine whether financial inclusion (FI) levels were converging among states and UT's by applying spatial panel regression methods. However, the results revealed an absence of spatial convergence in financial inclusion throughout the analysis period.

Dan - Dan Li et al. (2023) in this study, the researcher improved the methodology for constructing the financial inclusion index by incorporating both Euclidean distance and Mahalanobis distance approaches. The study took 55 countries and collected data on financial inclusion and estimated the data by traditional and improved measurement methods. Improved measurement method resulted in a lower overall level of financial inclusion and maintained the IFI within a narrow range of fluctuation compared to the traditional method.

Md Tarique et al. (2022) the impact of creating a bank account under PMJDY and its impact on socio-economic factors, especially MPI and financial literacy. The research is based on primary data obtained from a survey of 300 families in Bihar's Muzaffarpur district.

Neeraj Shah (2023) examined the existing research on the impact of PMJDY on access to credit for individuals living below the poverty line on both national and district levels. The paper aimed to show the correlation among various factors (GDP per capita, population density and literacy rate with a regression model.

Nguyen Yen Hai Dang et al. (2025) discovered the effect of financial inclusion (FI) on bank stability in ASEAN countries with the Fixed Effect Model (FEM), threshold estimation and Generalised Method of Moments methods. The findings showed that FI tends to reduce bank stability, though its effects differ depending on individual banks and market structures.

Hamada Elsaid Elmaasrawy et al. (2025), Using the partial least squares approach, the study examined a negative correlation between the total deposit volume and the level of digital financial inclusion disclosure via

mobile banking, while identifying a positive correlation with total volume of loans and the rate of sustainable growth.

Most existing studies have discussed the financial inclusion across states such as those in the western and southern regions up to the year 2018 (Vishal Y. et al., 2020), but they have not adequately addressed the north-central states during the period 2020-2023. The present study focuses on this gap. The current study derives the Financial Inclusion Index (FII) and shows the performance of PMJDY across Indian states.

## RESEARCH METHODOLOGY

### Data source and Data Variables

This study utilises state-level secondary data gathered for analytical purposes from various sites such as PMJDY, Indiastat, dbt Bharat.com, Periodic Labour Force Survey (PLFS) from MOSPI, and Census of India over the period from 2020 to 2023.

Previous literature has employed various approaches to measure the Financial Inclusion Index (FII). While some studies have assessed financial inclusion using individual indicators and proxies, others have developed composite indices that capture multiple dimensions of financial inclusion. Among the commonly used indicators are the availability of banking services and the number of bank accounts held at a formal financial institution (Datta & Singh, 2019; Arora & Kumar, 2026; Gupta et al., 2014).

Some studies have also measured financial inclusion through branch and ATM penetration, reflecting the accessibility of financial services within an economy (Datta & Singh, 2019; Gupta et al., 2014; Sha'ban et al., 2024). Most recently, researchers have increasingly focused on digital financial inclusion as an emerging dimension of financial access and usage (Sha'ban et al., 2024).

In selecting the metrics for the present study, consideration was given to the core objectives of PMJDY and the availability of consistent state-level data. Accordingly, the Financial Inclusion Index (FII) is constructed using four indicators: accounts per 1000 people (Arora & Kumar, 2026), accounts per household and debit cards per household (Raichoudhury, 2025), and DBT amount per household.

Previous studies have recognised Direct Benefit Transfer as an important indicator of financial inclusion and active account usage under PMJDY and other government welfare schemes. Building on existing studies, the current study develops a novel state-level indicator, namely DBT Amount per household, calculated as the total value of DBT disbursements divided by the number of households in each state. This measure captures the intensity of government transfers routed through PMJDY-linked banking infrastructure and serves as a proxy for active account utilisation rather than mere account ownership.

The current study uses four banking metrics to assess the performance of PMJDY: accounts per 1000 people, accounts per household, debit cards per household, and Direct Benefit Transfer (DBT) per household across Indian states.

- Account Per 1000 People: This metric refers to the number of people who access the account per 1000 population ( $X_1$ ).
- Account Per Household: This metric refers to the average number of bank accounts held per household ( $X_2$ ).
- Debit Cards Per Household: This metric refers to the average number of Rupay debit cards held per household ( $X_3$ ).
- DBT amount per household: This metric refers to the average number of DBT amounts held per household ( $X_4$ ).

Table 1 shows some selected variables, such as Account per 1000 people, Account per household, Debit card per household, and Direct Benefit Transfer (DBT) amount per household across the Indian states.

Table. 1: State-wise Performance under PMJDY

States	2020				2023			
	The number of accounts per 1000 people	The number of accounts per Household	The number of Debit cards per household	The amount of DBT per household (Rs.)	The number of accounts per 1000 people	The number of accounts per Household	The number of Debit cards per household	The amount of DBT per household (Rs.)
<b>Andhra Pradesh</b>	212.45	0.81	0.63	18096.24	276.2	1.04	0.64	23333.25
<b>Arunachal Pradesh</b>	230.95	1.2	1.04	17752.47	287.62	1.57	1.09	39280.89
<b>Assam</b>	511.9	2.92	1.77	13721.49	645.92	3.08	1.7	28820.07
<b>Bihar</b>	389.13	2.41	1.9	31361.76	449.27	2.52	1.84	22124.92
<b>Chhattisgarh</b>	516.96	2.54	1.74	18824.93	566.64	2.91	1.78	37250.73
<b>Goa</b>	107.95	0.5	0.35	9922.82	129.87	0.53	0.36	11109.56
<b>Gujarat</b>	227.44	1.33	1.03	18530.74	254.49	1.29	0.97	24824.49
<b>Haryana</b>	264.5	1.6	1.22	23581.67	318.5	1.54	1.04	26632.61
<b>Himachal Pradesh</b>	199.96	0.85	0.66	9955.96	248.86	1.04	0.69	17353.49
<b>Jharkhand</b>	391.24	2.14	1.53	19789.35	459.34	2.57	1.75	20330.67

<b>Kar nat aka</b>	226.1	1.09	0.71	2356.1	277.41	1.16	0.69	21868.08
<b>Ker ala</b>	131.77	0.52	0.32	13891.39	170.78	0.65	0.35	13888.42
<b>Ma dhy a Pra des h</b>	414.31	2.28	1.73	28768.99	492.2	2.65	1.98	33520.13
<b>Ma har asht ra</b>	236.74	1.21	0.85	19042.79	267.54	1.22	0.84	20637.54
<b>Ma nip ur</b>	322.94	1.68	1.15	21463.24	330.58	1.69	1.07	17026.84
<b>Me ghal aya</b>	177.76	0.94	0.62	20172.7	224.18	1.05	0.64	46427.98
<b>Miz ora m</b>	263.55	1.42	0.47	36014.65	300.76	1.72	0.68	57558.92
<b>Nag alan d</b>	148.17	0.96	0.81	22287.03	171.24	0.89	0.68	32418.84
<b>Odi sha</b>	371.48	1.71	1.35	18922.42	452.05	2.01	1.44	29166.63
<b>Pun jab</b>	241.46	1.22	0.96	21770.65	288.13	1.41	0.99	31555.42
<b>Raj asth an</b>	364.97	2.16	1.71	27899.46	425.5	2.26	1.69	25022.45
<b>Sik kim</b>	130.43	0.58	0.44	11076.87	128.18	0.47	0.34	14946.03
<b>Ta mil Nad u</b>	143.96	0.56	0.46	10382.86	198.05	0.72	0.5	16582.37
<b>Tel ang ana</b>	268.61	1.12	0.91	18895.51	304.75	1.14	0.84	31383.33
<b>Tri pur a</b>	220.28	1.01	0.46	28459.54	242.89	1.03	0.38	53100.84

<b>Utt ar Pra des h</b>	304.35	1.84	1.34	27964.59	386.25	2.33	1.53	28583.35
<b>Utt ara kha nd</b>	237.66	1.17	0.92	11540.31	301.88	1.55	1.03	24775.64
<b>Wes t Ben gal</b>	402.63	1.68	1.07	12889.23	503.73	1.96	1.23	13287.28

Source: Researcher’s Calculation

The above Table 1 shows the significant rise in accounts per person, accounts per household, debit cards per household, and DBT amount per household between 2020 and 2023 across states. The highest number of accounts was observed in Assam, increasing from 511 per 1000 people in 2020 to 645 per 1000 people in 2023, followed by Chhattisgarh, West Bengal and Madhya Pradesh, which rose from 516, 402 and 414 per 1000 people in 2020 to 566, 503 and 492 per 1000 people in 2023, respectively. In terms of accounts per household, Assam, Chhattisgarh, Madhya Pradesh, Jharkhand, Bihar and Uttar Pradesh increased from 2.92, 2.54, 2.28, 2.14, 2.41 and 1.84 in 2020 to 3.08, 2.91, 2.65, 2.57, 2.52 and 2.33 in 2023, respectively.

For debit cards per household, Madhya Pradesh, Bihar, Chhattisgarh, Jharkhand and Assam rose from 1.73, 1.9, 1.74, 1.53 and 1.77 in 2020 to 1.98, 1.84, 1.78, 1.75 and 1.7 in 2023, respectively. Mizoram, Tripura, Meghalaya, and Arunachal Pradesh recorded an increase in DBT amount per household from 36015,28460, 20173 and 17752 in 2020 to 57559, 53101, 46428 and 39281 in 2023, respectively.

The present metrics are not on the same scale. Initially, the index for the selected metrics was computed using equation (1), applying equal weights to reflect the importance of the financial inclusion dimension.

Equation 1:

$$f = g * \frac{X - X_{MIN}}{X_{MAX} - X_{MIN}} \dots\dots\dots (1)$$

Here,

g, indicates weight allotted to the metrics, which range from 0 < g > 1.

X indicates the real value of metrics.

X<sub>MIN</sub>, defines the min value of metrics.

X<sub>MAX</sub>, defines the max value of metrics.

f, indicates metrics of the FI.

In terms of metrics, the greater value (close to 1) of f refers to the high inclusion. If the value of G = (1,2,3,4...) shows the top condition, whereas point 0 indicates the worst condition. A higher value between X and X<sub>MIN</sub> and a low value from the bottom part are parallel to high financial inclusion, and vice versa.

Equation 2:

$$X_1 = \frac{\sqrt{f_1^2 + f_2^2 + f_3^2 \dots + f_n^2}}{\sqrt{w_1^2 + w_2^2 + \dots + w_n^2}} \dots\dots\dots (2)$$

Formula (2) shows the Euclidean distance, which indicates how far the state is from the worst condition, where all financial inclusion values are zero. The greater value of  $X_1$  indicates high financial inclusion of a state and vice versa.

Equation 3:

$$X_2 = 1 - \frac{\sqrt{(w_1 - f_1)^2 + (w_2 - f_2)^2 + \dots \dots + (w_n - f_n)^2}}{\sqrt{w_1^2 + w_2^2 + \dots \dots + w_n^2}} \dots\dots\dots (3)$$

Formula (3) shows the Inverse Distance from the best point, which tells us how close the state is to the best possible financial inclusion, where each metric reaches its maximum values. Represents the low financial inclusion if the value of  $X_2$  is low and vice versa.

Equation 4:

$$\text{Financial inclusion index (FII)} = \frac{X_1 + X_2}{2} \dots\dots\dots (4)$$

Formula (4) shows, FII value is the average value of  $X_1$  and  $X_2$ .

Based on existing studies (Goyari,2018; Vishal,2020), the calculated financial inclusion index (FII) is categorised into three sub-categories:

FII value	Signifies	Performance in PMJDY
$0.5 < \text{FII} \leq 1$	High FI	Outstanding
$0.3 \leq \text{FII} < 0.5$	Moderate FI	Average
$0 \leq \text{FII} < 0.3$	Low FI	Poor

In this study, the Wilcoxon Signed-Rank test is to be used to measure the changes in the Financial Inclusion Index between 2020 and 2023 (Antonijević et al., 2022). This non-parametric test is appropriate for paired observations when the normality assumption is violated. Therefore, the Wilcoxon Signed-Rank test is employed as the primary statistical test.

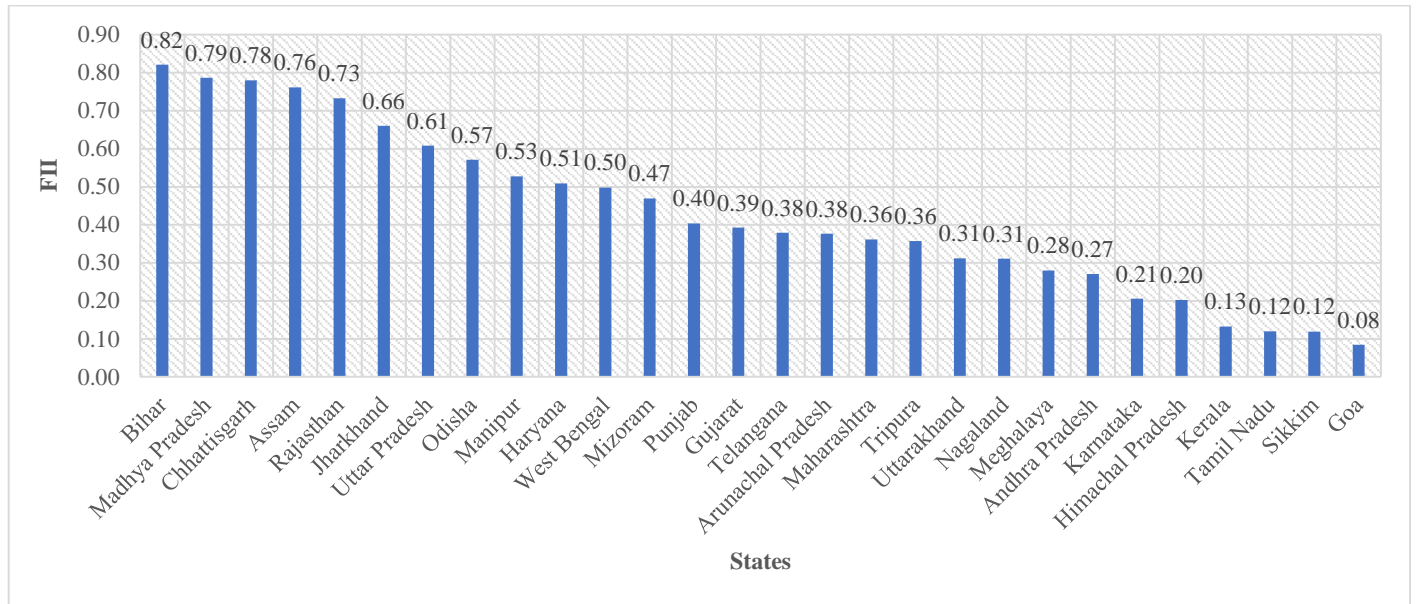
## RESULTS

### Performance of PMJDY Results

Figure. (1) depicts the financial inclusion index of four metrics of financial inclusion across states. In 2020, Figure 1 shows that Bihar state registered the highest values of FII (0.82), tracked by Madhya Pradesh with an FII value of 0.79, followed by Chhattisgarh, Assam, Rajasthan, Jharkhand, Uttar Pradesh, Odisha, Manipur, Haryana and West Bengal with FII values of 0.78, 0.76, 0.73, 0.66, 0.61, 0.57, 0.53, 0.51 and 0.50, respectively. All these states fall into the high financial inclusion category. Bihar, MP, Rajasthan and UP states collectively called as BIMARU due to their low capita income, low literacy, etc., but their financial inclusion is very high, which represents the states' access to the financial services. Further, the FII value of Mizoram (0.47), followed by Punjab, Gujarat, Telangana, Arunachal Pradesh, Maharashtra, Tripura, Uttarakhand and Nagaland, with FII values 0.40, 0.39, 0.38, 0.38, 0.36, 0.31 and 0.31, respectively. These states show the average performance in this Govt scheme. On the other hand, FII values ( $0 \leq \text{FII} < 0.3$ ) of the rest of India (mentioned in figure 1) under

the category of low financial inclusion, such as Meghalaya, Andhra Pradesh, Karnataka, Himachal Pradesh, Kerala, Tamil Nadu, Sikkim and Goa.

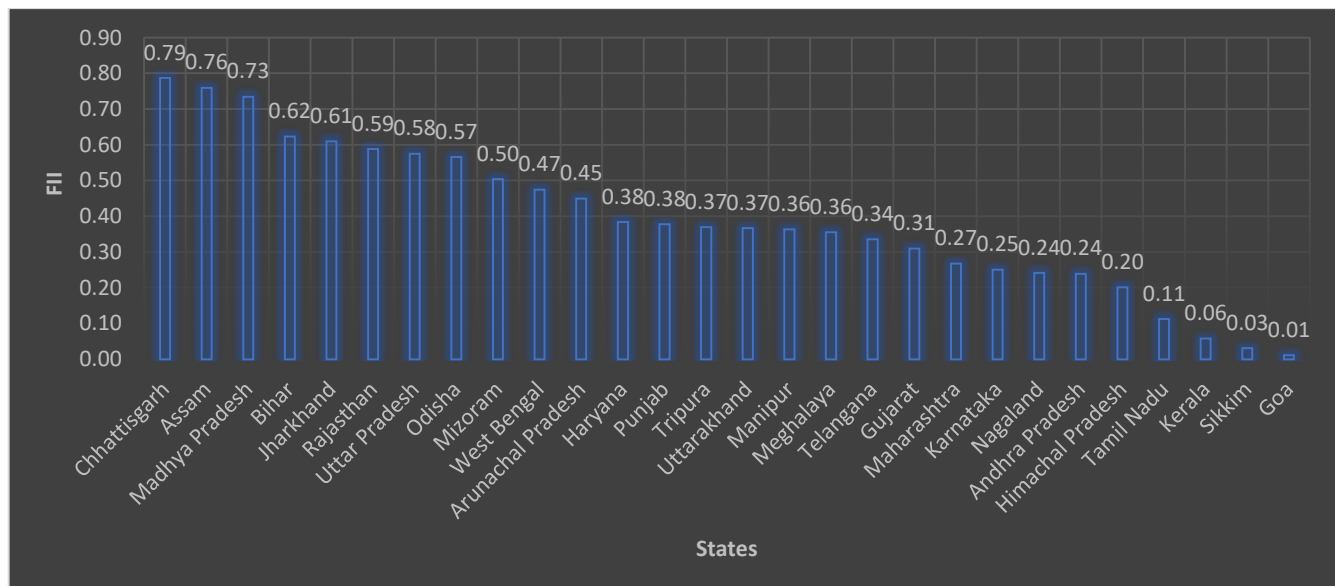
Figure:1 shows the state-wise financial inclusion in 2020.



Source: Researcher’s Calculation

Figure 2 represents the financial inclusion index of four metrics of financial inclusion across states in 2023. In 2023, Figure 2 shows that Chhattisgarh state recorded the value of FII (0.79), followed by Assam state with FII value (0.76), further followed by MP, Bihar, Jharkhand, Rajasthan, UP, Odisha and Mizoram with FII values 0.73, 0.62, 0.61, 0.59, 0.58, 0.57 and 0.50, respectively. All these states come under the category of high financial inclusion and outstanding performance in this scheme. BIMARU states lie in this category in 2023. Further, in the category of moderate financial inclusion, Indian states West Bengal, Arunachal Pradesh, Haryana, Punjab, Tripura, Uttarakhand, Manipur, Meghalaya, Telangana and Gujarat have FII values (0.47, 0.45, 0.38, 0.37, 0.37, 0.36, 0.34 and 0.3, respectively). On the other hand, FII values ( $0 \leq FII < 0.3$ ) of the rest of India (mentioned in the figure) fall under the category of low financial inclusion, such as Maharashtra, Karnataka, Nagaland, Andhra Pradesh, Himachal Pradesh, Tamil Nadu, Kerala, Sikkim and Goa and have poor performance in PMJDY.

Figure:2 shows the state-wise financial inclusion Index in 2023.



Source: Researcher’s Calculation

In Figures 1 and 2, Bihar, Madhya Pradesh, Rajasthan, Uttar Pradesh, Odisha, Jharkhand, Chhattisgarh, and Assam states of India remained under the category of high FII from 2020 to 2023. Mizoram’s performance in financial inclusion improved and entered under the category of high FII in 2023, but Haryana and Manipur declined and fell under the category of moderate FII in 2023. In the case of West Bengal, lie moderate category under the category of high financial inclusion in 2020, but in 2023, slight declined and entered into the moderate category.

Punjab, Arunachal Pradesh, Tripura, Uttarakhand, Telangana and Gujarat continued under the category of moderate FI. In the case of FI, the performance of Maharashtra and Nagaland states declined over the period.

Meghalaya’s performance in financial inclusion improved and entered the category of moderate FII in 2023. Karnataka, Nagaland, Andhra Pradesh, Himachal Pradesh, Tamil Nadu, Kerala, Sikkim and Goa continued under the category of low FI over the period and showed poor performance in this scheme.

The findings show that the BIMARU states, such as Bihar, MP, Rajasthan and UP, performed better and fell into the category of high financial inclusion during the period 2020-2023 despite facing socio-economic challenges such as low- income groups, low literacy and inadequate infrastructure, etc. The results of the present study are consistent with those reported in previous literature. Similar evidence has been documented by Maity and Majumder(2024) and Singh and Srivastava(2026), who reported that PMJDY had a relatively greater impact on financial inclusion in BIMARU states compared with many other regions of India.

### Wilcoxon Signed–Rank Test Results

The Wilcoxon Signed–Rank test is utilised to measure whether the changes in FII between 2020 and 2023 are statistically significant, and the normality assumption for the difference scores is violated according to the Shapiro-Wilk test. The Wilcoxon signed-rank test is a non-parametric alternative to the paired-sample t-test and is appropriate for analysing paired observations when the assumption of normality is not satisfied.

The result of the Wilcoxon Signed–Rank test at 1% level is as follows:

Sign	Obs	Sum ranks	Expected
-----+-----			
Positive	7	86.5	200
Negative	18	313.5	200
Zero	3	6	6
-----+-----			
All	28	406	406
H0: FII2023 = FII2020			
z = -2.588			
Prob >  z  = 0.0096			
Exact prob = 0.0083			

Table 2: Results of the Wilcoxon Signed–Rank test at 1% Significant level

Source: Researcher’s Calculation Using STATA

Table 2 presents the results of the Wilcoxon Signed–Rank test at the 1% significant level. The results reveal a statistically significant difference between the Financial Inclusion Index values of 2020 and 2023 ( $z = -2.588$ ,  $p = 0.0096$ ). Since the p-value is less than 0.01.

The test results further indicate that, among the 28 Indian states analysed, 18 recorded negative ranks, compared to only 7 states with positive ranks, while 3 states showed no change. This indicates that most of the states experienced a decline in the Financial Inclusion Index between 2020 and 2023. Therefore, the observed changes in the FII are statistically significant and unlikely to be attributable to random variation.

## CONCLUSION

The existing study compared the methods used for the Financial Inclusion Index and discussed the performance of FI in the southern, western, and central states, but did not examine the performance of north-central states such as BIMARU in India. This paper measures the performance of Indian states under PMJDY using the Financial Inclusion Index (FII) for the period 2020-2023, excluding 2014-2019, as most studies on that period already exist. To fulfil the purpose of this paper, secondary data on key indicators such as accounts per 1000 people, debit cards per household, accounts per household, DBT amount per household, etc., have been collected from various sources. The findings indicated that north-central states such as Bihar, MP, Rajasthan, UP (BIMARU) have performed better in financial inclusion, as compared to others and entered the high financial inclusion category. BIMARU states have shown better performance in terms of accounts per person, accounts per household, and debit cards per household, as compared to other states, but they continue to lag in DBT amount per household. In 2020, 11 states (including BIMARU states) were in the high financial inclusion category, but in 2023, this number decreased to 9. Some states, such as Goa, Sikkim, Tamil Nadu, etc., have performed well in financial inclusion, which indicates these states do not have access to banking services. Financial inclusion appears to be positively and significantly associated with accounts per 1000 people, debit cards per household, and accounts per household. The policymaker needs to focus on some states that have performed well in financial inclusion and promote opening accounts and usage.

## Limitation of the Study

The present study does not use credit-related indicators, such as overdraft facility and PMJDY-linked loan penetration, in constructing the Financial Inclusion Index (FII). Furthermore, the analysis is limited to two time periods, namely 2020 and 2023.

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