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# District Level Assessment of Financial Inclusion in India

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## Abstract

The study builds an index across districts of 27 Indian states for the period 2014 and 2018, i.e., prior to and after the launch of PMJDY. The FII is developed in line with Sarma (2012) methodology. The proposed index used three dimensions: Deposit Penetration, Credit Penetration, and Availability. The study's significant finding shows southern and western districts are performing better in financial inclusion than other districts. Most of the central, eastern, and north-eastern districts fell under the low inclusion category. Further, FII has a positive relation with HDI. Furthermore, the particular scheme PMJDY has not taken the economy towards high financial inclusion as the number of high inclusion districts increased from 6 in 2014 to just 9 in 2018, and medium inclusion districts increased from 41 in 2014 to 60 in 2018. The investigation suggests that monetary comprehensiveness needs a reasonable methodology that incorporates a fundamental update of the monetary framework and fortifying and growing monetary organizations amassing especially in backward regions, where government activity is required, at the same time handling digital education by making mindfulness, which will additionally expand the interest for monetary services.

**Keywords:** Financial Institutions, Financial inclusion index (FII), Indian districts, PMJDY.

## **1. Introduction**

Financial development plays a vital role in the country's growth process. The strong financial sector offers easy access to formal credit at low transaction costs. To improve financial sector institutions, every citizen needs to access financial institutions at a reasonable cost. Financial inclusion is the process of ensuring that every person has access to financial services at a low rate, with timely access to credit, especially for the vulnerable. It aims to mobilize savings that eventually raise economic output, strengthen socioeconomic metrics, and foster gender equality and empowerment. Rangarajan (2008) defines financial inclusion as "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".

In India, about 67% of people live in rural areas, and many of them do not have access to financial services provided by banks and other institutions. Lack of financial literacy and poor human growth is a significant barrier to accessing financial resources between the rural and the weakest parts of society. Often, they have to resort to informal credit sources that charge exorbitant interest rates, leading to exploitation.

Financial inclusion is a multi-dimensional concept used to describe a financial infrastructure that offers convenient access to financial services at a reasonable cost to households and enterprises, regardless of their size and market value. (Mohan 2006; Allen, 2012) argues that bank accounts increase savings, empower women, raise household spending and increase sustainable investment, which in turn accelerates economic growth. Financial inclusion allows institutions to function within the context of robust legislation, operational structures, and industry-specific performance criteria. It provides sustainability to the success of institutions and guarantees financial security through the continuity of funds. It helps to assign financial risks to those agents who can handle them without damaging their financial position (Demirguc-Kunt et al., 2008).

To achieve financial inclusion in India GOI started Pradhan Mantri Jan-Dhan Yojana, whose primary tenant was to provide banking to the unbanked by providing no-frills bank account, securing the unsecured by providing them with free life insurance of two lakh, funding the unfunded by providing with micro-credits such as overdraft facility, pension, etc.

Numerous investigations were led to survey the monetary incorporation status at India level. Our examination goes above and beyond by building up an FII among 27 Indian states district and proposed new measurement estimations for FII at district level, in particular the

number of credit accounts per 1,000 population. The examination key outcomes recommend that the FII marker's level mirrors a slight expansion in inclusion during 2014–2018. Most areas in the central, eastern, and north-east have shown low inclusion. Plus, PMJDY has done little to push areas from low to medium inclusion.

The rest of the study is arranged as follows: Section 2 discusses the literature survey, Section 3 covers data and methodology, Result and analysis are covered in Section 4, and Section 5 study concludes.

## **2. Literature Review**

Plenty of studies have been so far conducted on financial inclusion index with major differences in methodology and period of study at National and International Level. The first part deals with studies involving UNDP's methodology at national and international level, the second part cover studies involving Sarma (2008;2012) methodology, and the last part deals with the studies involving PCA approach in index development.

Using UNDP's methodology at the national level, Kainth (2011) constructed an IFI for Punjab using penetration, availability, and usage dimensions. Jalandhar district with an IFI value of 0.971 bagged the first position, and Mansa district bagged last. Gupte et al. (2012), using a similar methodology, developed an FII at the national level. The study involved four dimensions of financial inclusion. Similarly, at the national level (Poonam and Chaudhry, 2016; Sethy, 2016; Goel and Sharma, 2017; Sethy and Goyari, 2018), developed financial inclusion index using UNDP's methodology. Further, Yadav, Singh and Velan, (2020) and Yadav et al. (2020) developed FII for 27 Indian states with UNDP's methodology. Low financial inclusion was recorded in north-eastern states compared to others in the study's finding.

Similarly, at the international level utilizing UNDP's methodology (Sarma, 2008; 2012), developed an IFI using cross-country data. High-income countries were found to have high financial inclusion compared to other nations. Similarly, Yorulmaz (2013), using a similar methodology, developed an IFI for Turkey. The Istanbul region recorded THE highest IFI value, and the Mid-East Anatolia region recorded the lowest value. Further, Sha'ban et al. (2020) developed FII for 95 countries. Spain and The Democratic Republic of Congo bagged first and last positions, respectively.

Similarly, several studies involved Sarma (2008; 2012), methodology at national and international level. At the national level, using Sarma (2008), methodology Chattopadhyay (2011), developed an FII using penetration, availability, and usage dimensions. Maharashtra and Manipur bagged first and last positions, respectively. Similarly, following Sarma's (2008) methodology (Kuri and Laha, 2011; Laha and Kuri, 2014; Ambarkhane et al., 2016; Kaur and Abrol, 2018; Singh and Sarkar, 2020), developed an FII at the national level. Further, using Sarma's (2012) methodology, Gupta et al. (2014) and Deepti and Vaidhyasubramaniam (2018), developed an FII using penetration, availability, and usage dimensions at the national level.

At the international level, utilizing Sarma (2008) methodology, Chakravarty and Pal (2010), constructed an IFI using banking indicators for 21 countries. India secured the 13th position among the countries. Similarly, Pham et al. (2019) and Ali and Khan (2020), used a similar methodology for cross-country analysis.

On the other hand, several studies involved principal component analysis for index creation. Bagli and Dutta (2012), developed an index using a similar methodology at the national level. Goa and Manipur bagged top and last position. Similarly, Pineyro (2013), involving PCA, developed an index for Mexico's municipalities. Further, using a similar methodology (Camara and David, 2014; Datta and Singh, 2019; Nwidobie, 2019) developed FII for the cross-country analysis.

There is a lack of studies involving index creation at pan India district level and to assess PMJDY viability in boosting financial inclusion at district level. Our study moved one step forward by building index across district of 27 Indian states for the period 2014 and 2018, i.e., prior and after launch of PMJDY. The FII catches subtleties on the different parts of financial inclusion within a solitary number in the range of 0 and 1, where 0 and 1 show complete exclusion and complete inclusion.

### **3. Data and Methodology**

#### **3.1. Data**

The present study determined district-wise FII by employing three metrics of banking namely, deposit penetration, credit penetration, and availability of banking services.

(i) Deposit Penetration: It includes the following dimension;

- The number of deposit accounts per 1000 population ( $d_1$ ).

(ii) Credit Penetration: It includes the following dimension;

- The number of credit accounts per 1000 population ( $d_2$ ).

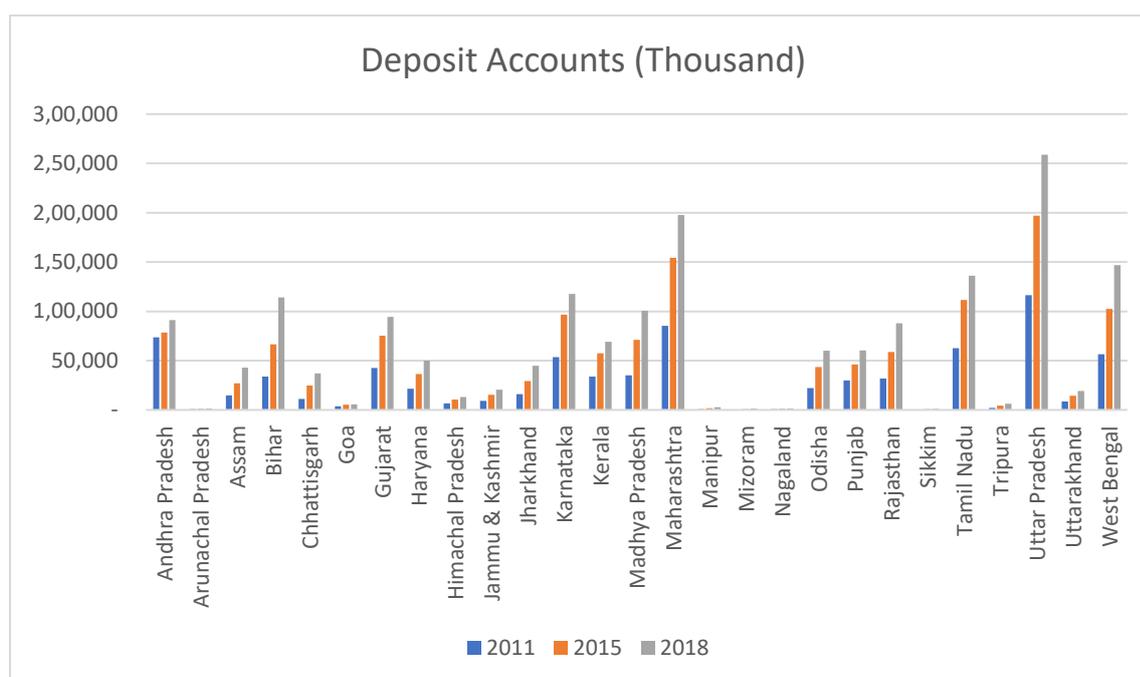
(iii) Availability: The following dimension measure it;

- The number of commercial bank branches per 100000 population ( $d_3$ ).

For the study period, secondary data were sourced from Reserve Bank of India's publications for 27 Indian states.

Figure 1-3, shows the state-wise trend of selected dimensions of financial inclusion from 2011-18.

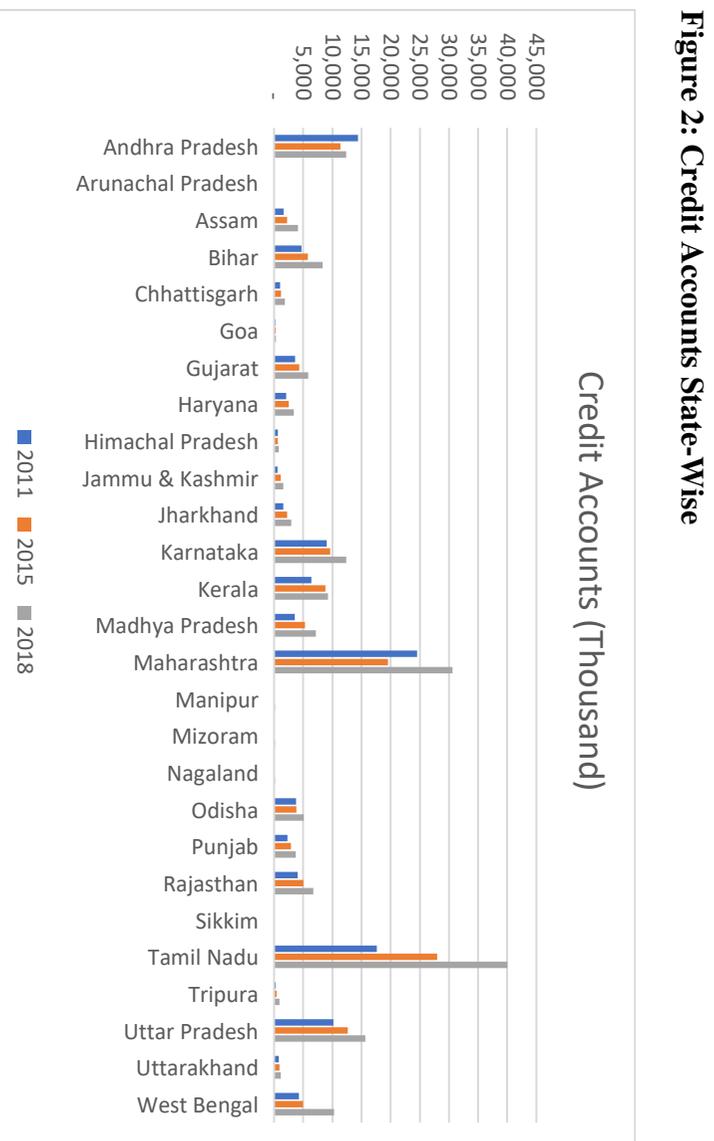
**Figure 1: Deposit Accounts State-Wise**



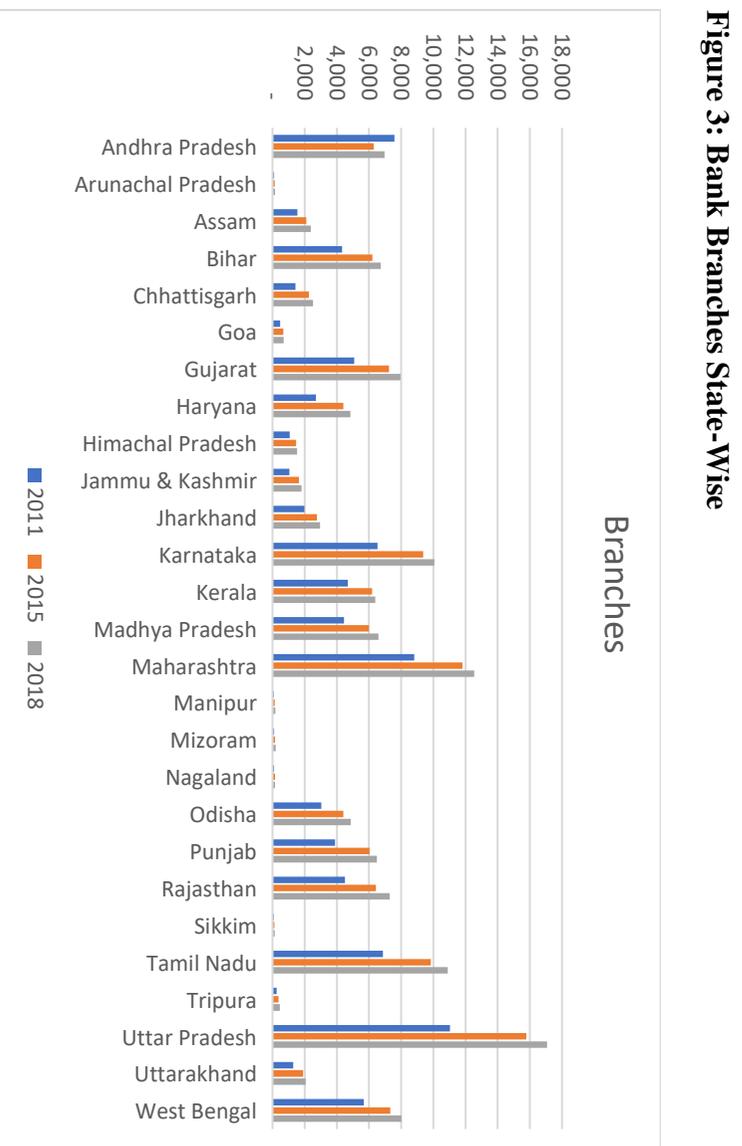
Source: Author's Compilation

Figure 1, shows the state-wise deposit accounts over the period 2011-18. Overall, the accounts are increasing state-wise. The percentage growth in accounts for north-eastern states is low compared to other states.

Figure 2 and 3, represent the state-wise credit accounts and bank branches. Overall, the accounts and branches are increasing state-wise but the relative percentage growth in accounts and branches is low for north-eastern states compared to others.



Source: Author's Compilation



Source: Author's Compilation

### 3.2. Methodology

The present index is developed using Sarma (2012) methodology with equal weights allotted to each dimension. The index is developed using following formulas;

**Formula 1:**

$$d_i = w_i \left[ \frac{A_i - m_i}{M_i - m_i} \right] \quad (1)$$

Here,

- $w_i$ , represents weight assigned to the dimension  $i$ , that lie between 0 and 1.
- $A_i$ , represents the actual value of dimension  $i$ .
- $m_i$ , represents the minimum value of dimension  $i$ .
- $M_i$  represents the maximum value of dimension  $i$ .
- $d_i$  represents dimensions of financial inclusion  $i$ .

The formula 1 above represents dimension index where  $w_i$  are the weights allotted to each dimension that fall between 0 to 1. The best point  $W = (1, 2, 3 \dots)$  and worst point  $O = (0, 0, 0 \dots)$  are considered while deriving the index. Higher the value of  $d_i$ , higher will be inclusion.

**Formula 2:**

$$X_1 = \frac{\sqrt{d_1^2 + d_2^2 + d_3^2 + \dots + d_n^2}}{\sqrt{w_1^2 + w_2^2 + w_3^2 + \dots + w_n^2}} \quad (2)$$

**Formula 3:**

$$X_2 = 1 - \frac{\sqrt{(w_1 - d_1)^2 + (w_2 - d_2)^2 + \dots + (w_n - d_n)^2}}{\sqrt{w_1^2 + w_2^2 + w_3^2 + \dots + w_n^2}} \quad (3)$$

**Formula 4:**

$$FII = (X_1 + X_2) / 2 \quad (4)$$

Formula (2) and (3) determine the Euclidian and inverse Euclidian distance of  $X$  from  $O$  and  $W$ . The lower value of variables corresponds to low financial inclusion and vice – versa. Then by taking mean of both  $X_1$  and  $X_2$  the final index value is determined (Formula 4).

Based on previously based studies (Sarma, 2008; Sethy & Goyari, 2018; Yadav et al., 2020), the final FII values were categorized as follows:

- If FII falls under  $0.5 < FII \leq 1$ , then it represents high financial inclusion district.
- If FII falls under  $0.3 \leq FII < 0.5$ , then it represents medium financial inclusion district.

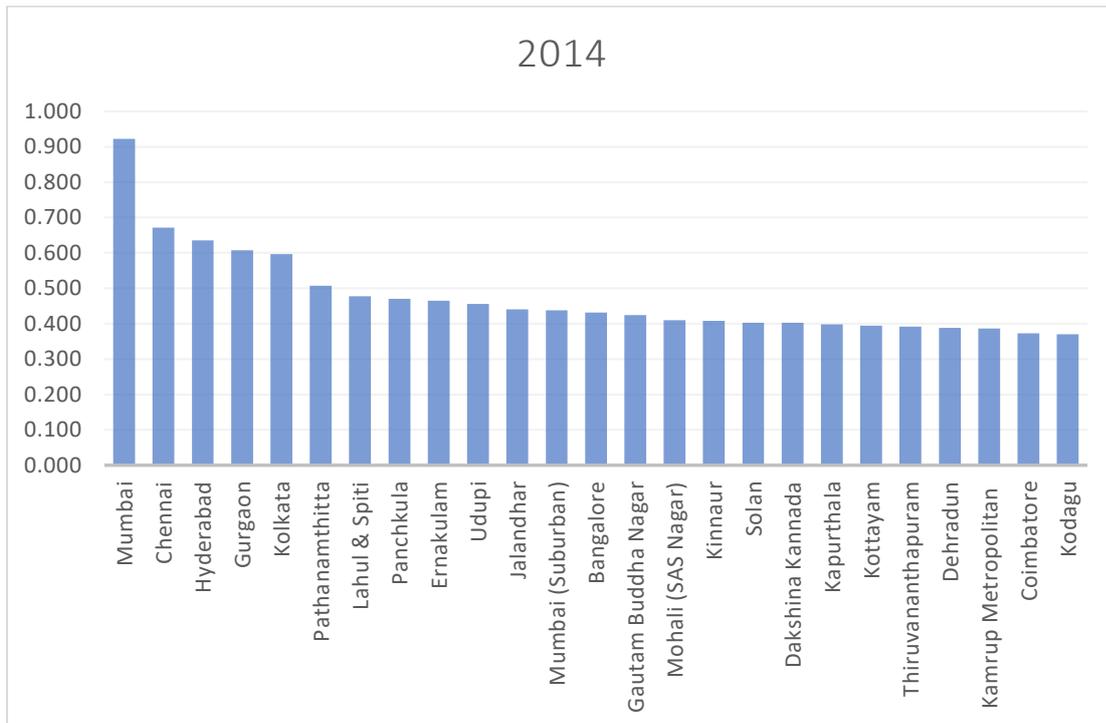
- If FII falls under  $0 \leq \text{FII} < 0.3$ , then it represents low financial inclusion district.

#### 4. Results and Analysis

Figure 4 and 5 (Appendix), represent India's district-wise financial inclusion index for the period 2014 and 2018.

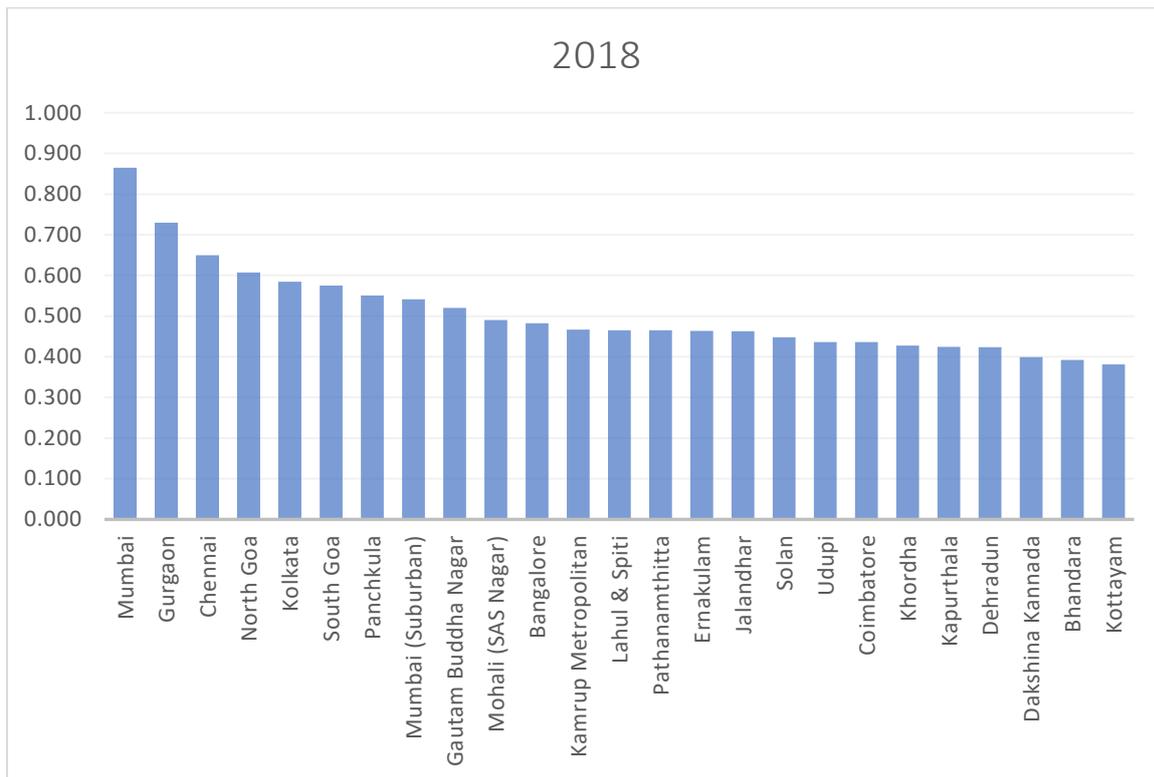
In 2014, from Figure 4 and Figure 6, the Mumbai district bagged the highest index value of 0.922, accompanied by the Chennai and Hyderabad district with index value 0.672 and 0.636, bagged second and third position. Gurgaon, Kolkata, and Pathanamthitta district also fell under high inclusion category along with above mentioned districts. Further, Lahul & Spiti district with index value (0.478), Panchkula district with index value (0.471), Ernakulam district with index value (0.465), Udupi district with FII value (0.456), and Jalandhar district with index value (0.440), along with 36 other districts fell under the medium inclusion category. On the other hand, Amritsar district with index value (0.296), Rupnagar, and Una district with index values, 0.294 and 0.292, respectively, and 558 other districts fell under the low inclusion category. Mon and Kurung Kumey district bagged the least ranks.

**Figure 6: Top 25 districts in 2014**



Source: Author's Analysis

**Figure 7: Top 25 districts in 2018**



Source: Author's Analysis

In 2018, from Figure 5 and Figure 7, the Mumbai district bagged the highest index value of 0.865, accompanied by the Gurgaon and Chennai district with index value 0.730 and 0.650, bagged second and third position. North Goa, Kolkata, South Goa, Panchkula, Mumbai (Suburban), and Gautam Buddha Nagar district also fell under high inclusion category along with above mentioned districts. The Panchkula, Mumbai (Suburban), and Gautam Buddha Nagar district shifted from medium inclusion in 2014 (Figure 4) to high inclusion category in 2018. Further, Mohali (SAS Nagar) district with index value (0.491), Bangalore district with index value (0.483), Kamrup Metropolitan district with index value (0.467), Lahul & Spiti district with FII value (0.465), and Pathanamthitta district with index value (0.465), along with 55 other districts fell under the medium inclusion category. Kerala's Pathanamthitta district shifted from high inclusion category in 2014 (Figure 6) to medium inclusion in 2018. (Figure 7). Punjab's Amritsar, Rupnagar, and Bathinda district shifted from low inclusion category in 2014 (Figure 4) to medium inclusion in 2018. (Figure 5). Himachal Pradesh's Una and Kullu district shifted from low inclusion category in 2014 (Figure 4) to medium inclusion in 2018. (Figure 5). Karnataka's Bangalore (Rural), Mysore and Chikmagalur district shifted from low inclusion category in 2014 (Figure 4) to medium inclusion in 2018. (Figure 5). Maharashtra's Pune and Bhandara district shifted from low inclusion category in

2014 (Figure 4) to medium inclusion in 2018. (Figure 5). On the other hand, Vadodara district with index value (0.298), Aizawl, and Rohtak district with index values, 0.296 and 0.295, respectively, and 528 other districts fell under the low inclusion category. Kiphire and Mon district of Nagaland bagged the least ranks.

Figure 4 and Figure 5 portrayed that the much of the districts fell under the low inclusion category. Comparatively, southern and western districts are performing better in financial inclusion than other districts. Most of the central, eastern, and north-eastern districts fell under low inclusion category. Only a limited district managed to increase the FII rank from low to medium category from 2014 to 2018.

Table 1 provides descriptive statistics for the Indian districts for the period 2014 and 2018. Descriptive figures portrayed that there's been a slight increase in inclusion across districts over the period. The FII value ranged from 0.00 to 0.92 in 2014, while on 2018 the value of index ranged from 0.02 to 0.87 in 2018. The mean value increased from 0.16 in 2014 to 0.19 in 2018. In 2014, 561 districts fall under the low inclusion category, which reduced to 531 districts in 2018, and 41 districts fall under the medium FII category in 2011, which got increased to 60 districts in 2018.

**Table 1: Descriptive Statistics**

|                        | <b>2014</b> | <b>2018</b> |
|------------------------|-------------|-------------|
| <b>Min.</b>            | 0.00        | 0.02        |
| <b>Max.</b>            | 0.92        | 0.87        |
| <b>Mean</b>            | 0.16        | 0.19        |
| <b>S.D.</b>            | 0.10        | 0.10        |
| <b>C.V.</b>            | 0.63        | 0.51        |
| <b>Total Districts</b> | 608         | 600         |
| <b>High FII</b>        | 6           | 9           |
| <b>Medium FII</b>      | 41          | 60          |
| <b>Low FII</b>         | 561         | 531         |

Source: Author's Analysis

Further, Table 2 reports the FII and HDI ranking for 2018 of Indian states. The result portrayed that FII has positive relation with HDI except in some north-east states. The similar results were reported in past studies (Kuri and Laha, 2011; Kodan and Chhikara, 2013;

Unnikrishnan and Jagannathan, 2015; Datta and Singh, 2019; Yadav, Singh and Velan, 2020).

**Table 2: FII and HDI ranking 2018**

| State             | FII Rank | HDI Rank |
|-------------------|----------|----------|
| Goa               | 1        | 2        |
| Punjab            | 2        | 4        |
| Kerala            | 3        | 1        |
| Himachal Pradesh  | 4        | 3        |
| Tamil Nadu        | 5        | 7        |
| Haryana           | 6        | 6        |
| Uttarakhand       | 7        | 12       |
| Andhra Pradesh    | 8        | 18       |
| Karnataka         | 9        | 13       |
| Sikkim            | 10       | 5        |
| Tripura           | 11       | 17       |
| Jammu & Kashmir   | 12       | 11       |
| Maharashtra       | 13       | 9        |
| Gujarat           | 14       | 15       |
| Mizoram           | 15       | 8        |
| West Bengal       | 16       | 19       |
| Odisha            | 17       | 24       |
| Rajasthan         | 18       | 20       |
| Assam             | 19       | 21       |
| Madhya Pradesh    | 20       | 23       |
| Chhattisgarh      | 21       | 22       |
| Arunachal Pradesh | 22       | 16       |
| Jharkhand         | 23       | 25       |
| Uttar Pradesh     | 24       | 26       |
| Bihar             | 25       | 27       |
| Manipur           | 26       | 10       |
| Nagaland          | 27       | 14       |

Source: Author's calculation & Global Data Lab.

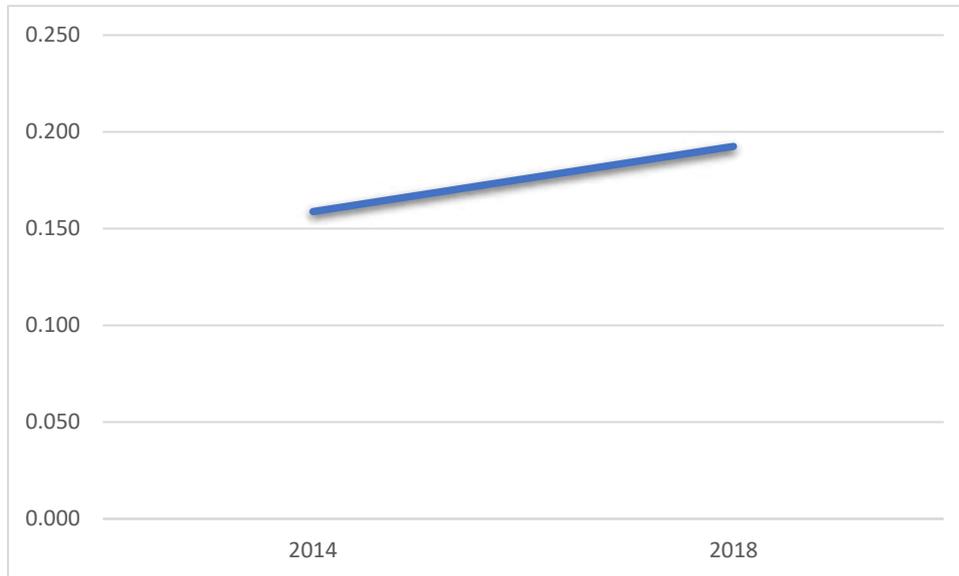
#### 4.4. Impact assessment of PMJDY

In 2014, prime minister Narendra Modi introduced a new scheme PMJDY to augment financial inclusion in India. Figure 4 and 5 showed that just a few districts managed to increase their rank from low inclusion category to medium inclusion.

Figure 8 illustrates that since 2014 there is just a minor improvement in FII for India. Before the launch of PMJDY, 41 districts fell under the medium inclusion category in 2014, which

rose to 60 districts in 2018 (Table 1). Thus, it can be said that the particular scheme PMJDY has not taken the economy towards high financial inclusion as high inclusion districts increased from 6 to just 9 in 2018.

**Figure 8: FII India (2014-18)**



Source: Author's Analysis

## 5. Conclusion

This paper built an index (FII) in line with Sarma (2012) methodology. The proposed index shows the status of inclusion across Indian districts. The district-wise index is built for 2014 and 2018. The proposed index used three dimensions: Deposit Penetration, Credit Penetration and Availability. The particular dimension number of credit accounts per 1000 population have not been used in the previous studies at district level.

The values of the FII reflected a slight increase in inclusion across districts over the period. The mean value increased from 0.16 in 2014 to 0.19 in 2018, most of the central, eastern, and north-eastern districts fell under low inclusion category. The particular scheme PMJDY has not taken the economy towards high financial inclusion as high inclusion districts increased from 6 in 2014 to just 9 in 2018, and medium inclusion districts increased from 41 in 2014 to 60 in 2018.

The major limitation lying with various financial inclusion dimensions' data availability can be extended further with data availability. Along these lines, significant changes are legitimized in the institutional setting. The investigation suggests that monetary comprehensiveness needs a reasonable methodology that incorporates a fundamental update of the monetary framework and fortifying and growing monetary organizations amassing especially in backward regions, where government activity is required, at the same time handling digital education by making mindfulness, which will additionally expand the interest for monetary services.

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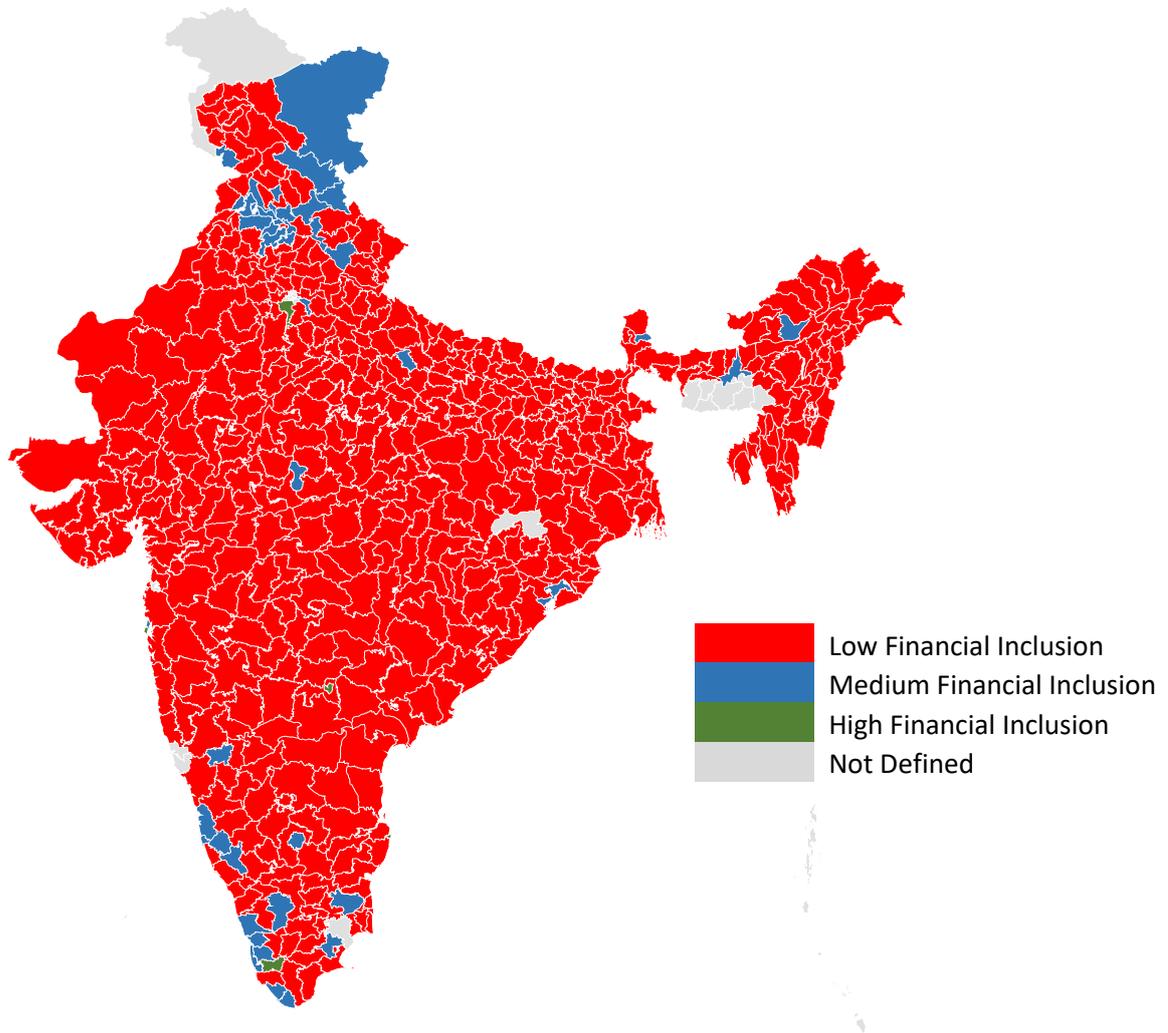
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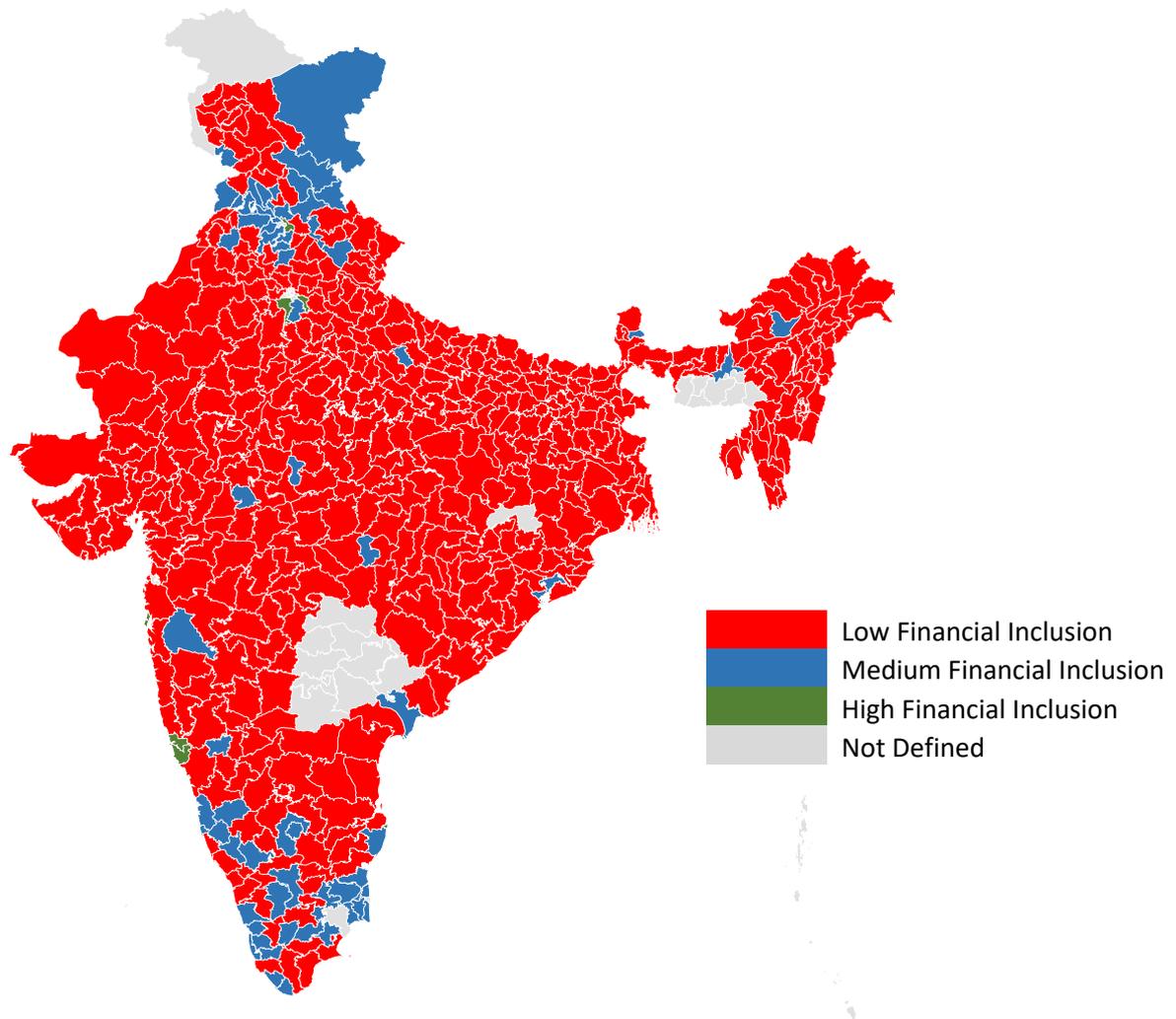
## Appendix

**Figure 4: FII District-Wise 2014.**



Source: Author's Analysis

**Figure 5: FII District-Wise 2018.**



Source: Author's Analysis