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Impact Assessment of Pradhan Mantri Jan-Dhan Yojana in Augmenting Financial Inclusion in India - A District-Level Analysis

Vishal Yadav¹, Shishir Kumar Singh², Nirmala Velan¹, Md Asif Aftab³, Ravi Kumar⁴ & Aman Kumar Swarnkar⁵

¹Department of Economics, School of Management, Pondicherry University, Puducherry, India

²School of Economics, University of Hyderabad, Hyderabad, India

³Department of Economics, Jamia Millia Islamia, Delhi, India

⁴Department of Economic Studies and Planning, Central University of Karnataka, Kalaburagi, India

⁵Centre for Economic Studies and Planning (SSS), Jawaharlal Nehru University, Delhi, India

Correspondence

Vishal Yadav¹, Department of Economics, School of Management, Pondicherry University,
Puducherry (Pondicherry) – 605014, India.

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

Abstract

The study builds up a financial inclusion index (FII) across 27 Indian states' districts utilizing UNDP's similar approach in constructing the Human Development Index. The FII is constructed for the period 2011-2018. The study additionally investigates government schemes' effectiveness, especially the PMJDY, in augmenting financial inclusion throughout its inception. The study's significant finding shows that a greater part of the Indian locale falls under the class of low financial inclusion. Southern areas perform better while the central, eastern, and north-eastern locale perform poorly in financial inclusion. Further, FII and HDI have a positive association between them. Furthermore, the PMJDY framework has not driven the economy towards a high degree of financial inclusion. Only a couple of areas improve their rank from low to medium financial inclusion. Subsequently, underlying changes are legitimized in the institutional setting by fortifying and growing monetary organizations while handling digital literacy.

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

1. Introduction

In the late 20th century, the question of what factors affect growth occupied a central theme among economists. **Schumpeter (1911)** recognized the chief role of finance in the contribution of development. The same was confirmed by the empirical study done by **Singh and Mishra (2014; 2015)**. In opposition **Robinson (1952)** holds the opposite view, "where enterprise leads finance follows," meaning growth in finance itself results from economic growth. **Lucas (1988)** refuted altogether the role of finance in the growth equation of a nation.

Financial inclusion means provisioning of financial services to the marginalized section of society, which should be both affordable and equitable. 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." Financial inclusion seeks to open a bank account and provides citizens with financial awareness and the purchasing strength that can stimulate demand for financial services. Further, a society needs vital financial institutions that should be affordable, reachable with less red-tapism. Financial inclusion is often linked with the growth & development of an economy, and every nation strives for the financial inclusion of all its citizens.

In developing countries like India, access to finance is a significant hurdle for the poor and marginalized, especially in rural areas. They have to depend on the informal moneylenders that charge them higher interest rates that they often fail to repay, and hence indebtedness rises, creating a vicious cycle of indebtedness. A lack of concentration of rural financial institutions and financial literacy and awareness are barriers to access finance. A robust financial structure will promote people's well-being and lead to channel funds for investment, thereby increasing credit availability in the economy, hence increasing capital assets and economic growth.

In 2014, the Indian government launched Pradhan Mantri Jan Dhan Yojna (PMJDY) under the National Mission for Financial Inclusion, which envisages universal access to banking facilities for every Indian citizen. PMJDY accounts provide a Basic Savings Bank Deposit (BSBD) account, Life, and Accident insurance cover. These accounts are connected to Aadhar, which serves as a conduit for the direct transfer of benefits (DBT) for various government schemes.

Many studies were conducted to assess the financial inclusion status at pan India. Our research goes one step further by developing a financial inclusion index (FII) among districts of 27 states of India and proposed new dimension measurements for FII, namely the number of commercial bank branches per 1,000 sq. km., the number of

agricultural credit accounts per 1,000 population and the number of non-agricultural credit accounts per 1,000 population. The analysis key results suggest that the FII indicator's level reflects a slight increase in financial inclusion during 2011–2018. Most locales in the central, eastern, and north-east have indicated low financial inclusion. Besides, PMJDY has done little to push districts from low to medium financial inclusion.

The remaining study is planned as follows: Section 2 audits the accessible literature on the financial inclusion index. Data and methodology are delineated in Section 3. Result and Analysis are illustrated in Section 4. The study concludes with Section 5.

2. Literature Review

So far, several studies have been conducted with a substantial variation in time and parameters used in the development of the financial inclusion index at sub-national, national, and international levels. The first part of the survey deals with Indian states' studies, the second part of the survey deals with studies on the Indian level, and the third part deals with studies on the International level.

The most notable study on Indian states done by **Kainth (2011)** utilizing UNDP methodology, constructed a district-level financial inclusion index for Punjab state. The FII involved three banking indicators, namely, penetration, availability, and usage. The studies' significant finding is that six districts fall under high and very high financial inclusion categories, with Jalandhar bagging the top position. Three districts fall under medium financial inclusion, and the remaining districts fall under the low financial inclusion category. Further, (**Chattopadhyay, 2011; Kuri and Laha, 2011**) utilized Sarma's (2008) methodology in constructing an FII for Indian states. The studies employed three banking indicators: penetration, availability, and usage in constructing the FII. The study's significant finding is that Maharashtra & Chandigarh, respectively, bagged top positions and fell under the studies' high financial inclusion category. Manipur bagged the last position in both studies and fell under the low financial inclusion category. **Bagli and Dutta (2012)** utilized principal component analysis and constructed a comprehensive FII with ten banking sector indicators for 28 Indian states. Similarly, **Gupta et al. (2014)**, utilizing Sarma's (2012) methodology, constructed an IFI for 28 Indian states. The study's significant finding is that Goa bagged the highest IFI while Manipur bagged the least IFI.

Laha and Kuri (2014), utilizing Sarma (2008) methodology, developed an FII using demand and supply-side indicators, separately. The study's significant finding is that the southern and western states perform better in financial inclusion. Similarly, **Ambarkhane et al.**

(2016), using three indicators, namely demand, supply, and infrastructure, constructed a financial inclusion index utilizing Sarma (2008) methodology combined with population growth, corruption as drag factors for 21 Indian states. The study's significant finding is that Kerala recorded the highest rank among the 21 states, and Chhattisgarh recorded the last rank. Further, (Poonam and Chaudhry, 2016; Sethy and Goyari, 2018), utilizing UNDP's methodology, constructed an FII using three banking indicators for Indian states. The studies' significant finding is that most Indian states fall under the low financial inclusion category. Similarly, Kaur and Abrol (2018) followed Sarma (2008) methodology to construct an IFI for the Indian state of Jammu & Kashmir using three banking sector indicators: penetration, availability, and usage. The study's significant finding is that Jammu district recorded the highest rank, followed by the Srinagar district, while Kishtwar recorded the last rank in terms of IFI value.

Crisil (2018), using four penetration indicators, namely, branch, credit, deposit, and insurance, constructed a district-wise FII of India. The study's significant finding is that North-Eastern states fall under the low financial inclusion category. Southern states are performing better than other states, with Kerala scoring the top position. Singh and Sarkar (2020) followed Sarma (2008) methodology to construct an IFI for Jharkhand state using three banking sector indicators: penetration, availability, and usage. The study's significant finding is that Ranchi and Purbi Singhbhum district fall under the high financial inclusion category. Garhwa district recorded the lowest IFI value (0.055). Further, Yadav et al. (2020), utilizing UNDP methodology, developed an FII using demand and supply-side indicators, separately. The study found that Southern and Western states are performing better compared to other states.

Similarly, several studies have been conducted so far on the National level. Gupte et al. (2012), utilizing UNDP methodology, constructed a national level FII for 2008 and 2009. The study found that financial inclusion increased from 2008 to 2009 for India. Further, (Goel and Sharma, 2017; Sethy, 2016) utilized UNDP's methodology to develop an FII for India. Similarly, Deepthi and Vaidhyasubramaniam (2018), utilizing Sarma's (2012) methodology, constructed an IFI for India using three banking sector indicators: penetration, availability, and usage. The study's significant finding is that India falls under the low financial inclusion category from 2011-12 till 2014-15. In 2015-16, India attained medium financial inclusion due to an increase in indicators' value.

On the other hand, there are various studies conducted on the international level. The most notable study done by Sarma (2008), utilizing UNDP methodology, constructed an IFI for 55 countries using three banking sector indicators: penetration, availability, and usage. The study's significant finding is that Spain recorded the top

position in terms of IFI value and fall under the high financial inclusion category. India ranked 31st, thus falling under the low financial inclusion category. Similarly, utilizing UNDP methodology, **Sarma (2012)** constructed an IFI using three banking sector indicators: penetration, availability, and usage for developed and developing countries.

Chakravarty and Pal (2013), utilizing Sarma's (2008) methodology developed an IFI for 21 countries, including India using eight banking sector indicators. The study's significant finding is that India ranked 13th among the 21 nations with equal contribution attributed by each indicator in achieving higher inclusion. Further, **Yorulmaz (2013)**, utilizing UNDP methodology, constructed an IFI for Turkey using three banking sector indicators: penetration, availability, and usage. The IFI was constructed for 12 regions and 80 cities falling under 12 regions from 2004-10 using the indicators mentioned above. The study's significant finding is that the Istanbul region bagged top rank with the highest IFI value throughout the period. The Mid – East Anatolia region bagged the last rank with the lowest IFI value. Similarly, (**Camara and David, 2014; Datta and Singh, 2019; Nwidobie, 2019; Pineyro, 2013**), utilizing principal component analysis, developed a financial inclusion index for developed and developing nations.

Further, (**Ali and Khan, 2020; Pham et al., 2019**) utilized Sarma's (2008) methodology to develop an IFI using cross-country data. Similarly, utilizing HDI methodology, **Sha'ban et al. (2020)** constructed an FII with cross-country data, using three banking sector indicators: use, access, and depth. The study's significant finding is that Spain bagged the top position while The Democratic Republic of Congo bagged the last FII values among the 95 countries. India bagged the 54th rank with an FII value of 0.135.

Following the literature review, there are lacunae for cross-sectional studies of FII at the All-India district level for a more extended period. Likewise, there is a dearth of a far-reaching study investigating government plans' viability, especially the PMJDY, in financial inclusion throughout its inception at the subnational level. The current research fills the void by creating India's district-wise FII for the period 2011-2018. The FII captures details on the various aspects of financial inclusion with a single number between 0 and 1, where 0 and 1 indicate full financial exclusion and full financial inclusion.

3. Data and Methodology

3.1. Data

The current study used three banking metrics to determine district-level FII, namely, deposit penetration, credit penetration, and availability of banking services.

(i) Deposit Penetration: This metric tests the number of people accessing the deposit accounts. The following dimension measure it;

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

(ii) Credit Penetration: This metric tests the number of individuals obtaining credit. The following dimensions measure it;

- The number of agricultural credit accounts per 1000 population (d_2).
- The number of non – agricultural credit accounts per 1000 population (d_3).

(iii) Availability: The following dimensions measure it;

- The number of commercial bank branches per 100000 population (d_4).
- The number of commercial bank branches per 1000 sq. km (d_5).

For the study, district-wise, secondary data had been collected for the analysis from Census of India, Economic and Political Weekly Research Foundation (EPWRF), Reserve Bank of India from 2011 to 2018 spread across 27 Indian states.

Table 1 tracks the pattern of selected variables, namely deposit account, credit account, and bank branches over the period 2011, 2015, and 2018, for the state-wise financial inclusion data.

Table 1: Trends of state-wise financial inclusion indicators

| States | Deposit Accounts (Thousand) | | | Credit Accounts (Thousand) | | | Branches | | |
|-------------------|-----------------------------|--------|----------|----------------------------|--------|--------|----------|-------|-------|
| | 2011 | 2015 | 2018 | 2011 | 2015 | 2018 | 2011 | 2015 | 2018 |
| Andhra Pradesh | 73,614 | 78,446 | 91,175 | 14,396 | 11,383 | 12,385 | 7,571 | 6,290 | 6,958 |
| Arunachal Pradesh | 667 | 1,061 | 1,546 | 65 | 81 | 86 | 86 | 135 | 154 |
| Assam | 14,729 | 27,155 | 42,720 | 1,644 | 2,242 | 4,081 | 1,546 | 2,103 | 2,374 |
| Bihar | 33,758 | 66,630 | 1,14,165 | 4,725 | 5,819 | 8,293 | 4,323 | 6,210 | 6,729 |
| Chhattisgarh | 11,216 | 24,697 | 36,974 | 1,046 | 1,210 | 1,878 | 1,423 | 2,253 | 2,521 |
| Goa | 3,620 | 5,196 | 5,757 | 225 | 286 | 308 | 470 | 670 | 686 |
| Gujarat | 42,418 | 75,374 | 94,293 | 3,631 | 4,341 | 5,862 | 5,073 | 7,241 | 7,959 |
| Haryana | 21,453 | 36,332 | 50,062 | 2,085 | 2,488 | 3,365 | 2,690 | 4,407 | 4,849 |
| Himachal Pradesh | 6,640 | 10,497 | 13,232 | 628 | 677 | 794 | 1,077 | 1,466 | 1,533 |
| Jammu & Kashmir | 9,099 | 15,392 | 20,578 | 594 | 1,139 | 1,580 | 1,041 | 1,634 | 1,799 |
| Jharkhand | 15,951 | 29,193 | 44,821 | 1,605 | 2,219 | 2,941 | 1,984 | 2,763 | 2,960 |

| | | | | | | | | | |
|----------------|----------|-----------|-----------|----------|----------|----------|--------|----------|----------|
| Karnataka | 53,580 | 96,759 | 1,17,549 | 9,055 | 9,652 | 12,357 | 6,518 | 9,365 | 10,068 |
| Kerala | 33,861 | 57,583 | 69,198 | 6,395 | 8,813 | 9,261 | 4,690 | 6,190 | 6,393 |
| Madhya Pradesh | 35,067 | 70,973 | 1,00,452 | 3,566 | 5,286 | 7,155 | 4,453 | 5,997 | 6,589 |
| Maharashtra | 85,351 | 1,54,381 | 1,97,698 | 24,537 | 19,524 | 30,635 | 8,816 | 11,810 | 12,545 |
| Manipur | 700 | 1,797 | 2,785 | 92 | 110 | 155 | 83 | 138 | 179 |
| Mizoram | 411 | 893 | 1,373 | 69 | 105 | 131 | 100 | 151 | 191 |
| Nagaland | 648 | 1,063 | 1,433 | 99 | 114 | 134 | 95 | 145 | 161 |
| Odisha | 22,260 | 43,453 | 60,007 | 3,794 | 3,804 | 5,090 | 3,029 | 4,410 | 4,858 |
| Punjab | 29,961 | 45,969 | 60,450 | 2,310 | 2,869 | 3,718 | 3,895 | 6,024 | 6,490 |
| Rajasthan | 31,998 | 58,878 | 87,727 | 4,048 | 5,035 | 6,756 | 4,507 | 6,426 | 7,276 |
| Sikkim | 390 | 729 | 1,004 | 37 | 40 | 64 | 82 | 122 | 138 |
| Tamil Nadu | 62,503 | 1,11,612 | 1,36,223 | 17,615 | 27,956 | 40,025 | 6,864 | 9,847 | 10,893 |
| Tripura | 2,147 | 4,428 | 6,244 | 278 | 456 | 900 | 247 | 379 | 456 |
| Uttar Pradesh | 1,16,259 | 1,97,019 | 2,58,710 | 10,171 | 12,649 | 15,678 | 11,040 | 15,773 | 17,068 |
| Uttarakhand | 8,485 | 14,379 | 19,150 | 805 | 918 | 1,124 | 1,278 | 1,903 | 2,053 |
| West Bengal | 56,465 | 1,02,390 | 1,46,805 | 4,263 | 4,985 | 10,264 | 5,678 | 7,327 | 8,018 |
| All India | 8,10,130 | 14,39,892 | 19,11,503 | 1,20,724 | 1,44,239 | 1,96,977 | 92,117 | 1,30,482 | 1,41,909 |

Source: Author's Compilation

The above table 1 indicates a significant rise in the deposit account, credit account, and branches between 2011 and 2018 across states. The bank account rose from 8,10,130 thousand in 2011 to 19,11,503 thousand in 2018. The credit account went up from 1,20,724 thousand in 2011 to 1,96,977 thousand in 2018. Simultaneously, the branches of commercial banks rose from 92,117 in 2011 to 1,41,909 in 2018. However, in terms of divisions, the North-Eastern states still lag relative to other states. With the last census compiled in 2011, the account should be taken of the subsequent population growth with the growth of financial services during FII construction.

3.2. Methodology

The current index is a unit-free index, determined using UNDP's similar approach in constructing the Human Development Index. In the first step, an index of dimensions was determined using equation (1) with assigned equal weights, indicating the financial inclusion dimension's significance.

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 .

In the respective dimension, the greater the value of d_i signifies greater attainment of inclusion. Each point $X = (1, 2, 3 \dots)$ will represent the n dimensions of financial inclusion. The point $W = (1, 2, 3 \dots)$ represents the best condition while point $O = (0, 0, 0, 0 \dots)$ is the worst. Both the best point, along with the worst point, are thought of while developing FII. Lower the difference between X and O and higher from W corresponds to low financial inclusion and vice versa.

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 (2) and (3) determine the Euclidian and inverse Euclidian distance of X from O and W . The lower value of X_1 and X_2 corresponds to low financial inclusion and vice – versa.

Formula 4:

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

The average of X_1 and X_2 determines the FII value, as shown in equation (4).

Based on previously conducted studies (Sarma, 2008; Sethy & Goyari, 2018; Yadav et al., 2020), the computed FII was categorized under three sub-categories:

- If the value falls under $0.5 < FII \leq 1$, then the district represents high financial inclusion.
- If the value falls under $0.3 \leq FII < 0.5$, then the district represents medium financial inclusion.
- If the value falls under $0 \leq FII < 0.3$, then the district represents low financial inclusion.

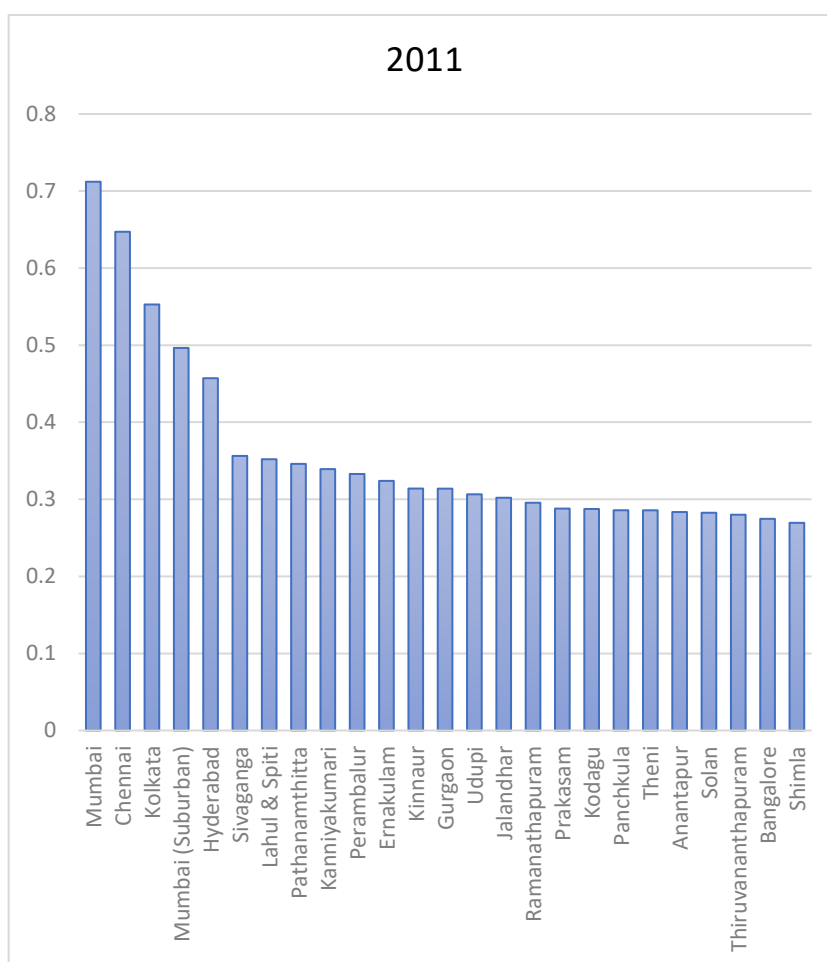
4. Results and Analysis

Figure 1 to Figure 8 (Appendix) represents India's district-wise financial inclusion index for the period 2011-2018.

In 2011, from Figure 1 and Figure 9, the Mumbai district recorded the highest FII value of 0.712, followed by the Chennai district with FII

value (0.647) and the Kolkata district with FII value (0.553), thus fall under the category of high financial inclusion. Further, Mumbai (Suburban) district with FII value (0.496), Hyderabad with FII value (0.457), Sivaganga with FII value (0.356), and Lahul & Spiti district with FII value (0.352), along with eight other districts fall under the category of medium financial inclusion. On the other hand, Ramanathapuram district with FII value (0.296), Prakasam district, and Kodagu district with FII values, 0.288 and 0.287, respectively, and 590 other districts fall under the category of low financial inclusion. Mon and Kiphire districts of Nagaland scored the least ranks with FII value of 0.008 and 0.006, respectively.

Figure 9: Top 25 Districts in 2011.

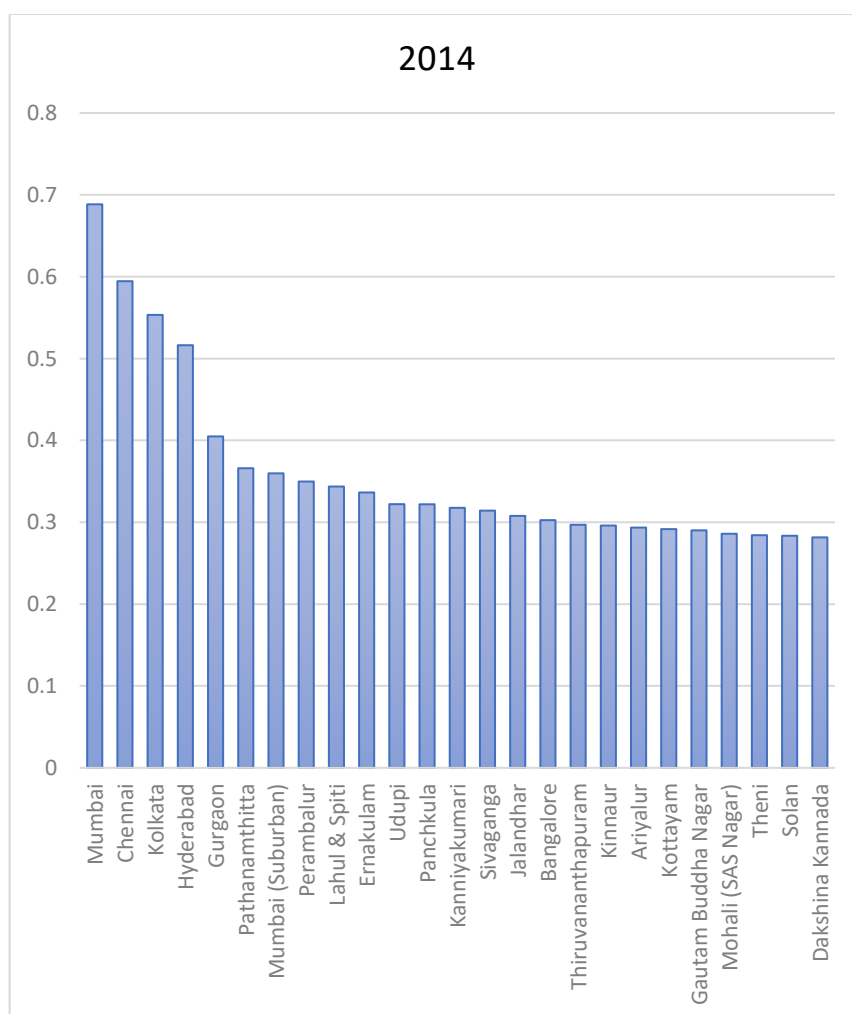


Source: Author's analysis

In 2014, from Figure 4 and Figure 10, the Mumbai district recorded the highest FII value of 0.688, followed by the Chennai district with FII value (0.594), the Kolkata district with FII value (0.553), and the Hyderabad district with FII value (0.516), thus fall

under the category of high financial inclusion. The Hyderabad district shifted from medium financial inclusion in 2013 (Figure 3) to high financial inclusion in 2014. Further, Gurgaon district with FII value (0.405), Pathanamthitta district with FII value (0.366), Mumbai (Suburban) district with FII value (0.360), and Perambalur district with FII value (0.350), along with eight other districts fall under the category of medium financial inclusion. Karnataka's Bangalore district shifted from low financial inclusion in 2013 (Figure 3) to medium financial inclusion in 2014 (Figure 4). On the other hand, Thiruvananthapuram district with FII value (0.297), Kinnaur district, and Ariyalur district with FII values, 0.296 and 0.294, respectively, 589 other districts fall under the category of low financial inclusion. The least ranks were scored by Mon district of Nagaland and Kurung Kumey district of Arunachal Pradesh with FII value of 0.007 and 0.002, respectively. The Thiruvananthapuram and Kottayam districts of Kerala, and Kodagu district of Karnataka, shifted from medium financial inclusion in 2013 (Figure 3) to low financial inclusion in 2014 (Figure 4).

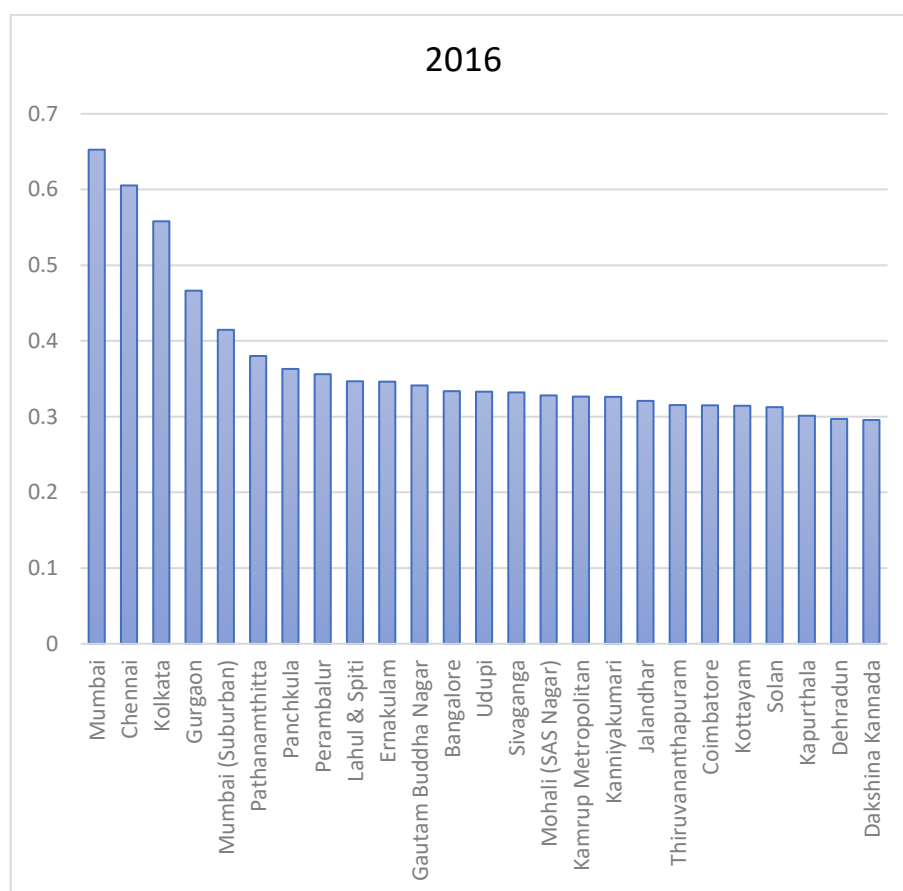
Figure 10: Top 25 Districts in 2014.



Source: Author's analysis

In 2016, from Figure 6 and Figure 11, the Mumbai district recorded the highest FII value of 0.653, followed by the Chennai district with FII value (0.605) and the Kolkata district with FII value (0.558), thus fall under the category of high financial inclusion. Further, the Gurgaon district with FII value (0.466), Mumbai (Suburban) district with FII value (0.415), Pathanamthitta district with FII value (0.380), and Panchkula district with FII value (0.363) along with 16 other districts fall under the category of medium financial inclusion. The Kapurthala district of Punjab shifted from low financial inclusion in 2015 (Figure 5) to medium financial inclusion in 2016 (Figure 6). On the other hand, Dehradun district with FII value (0.297), Dakshina Kannada district, and Thanjavur district with FII values, 0.296 and 0.295, respectively, and 572 other districts fall under the category of low financial inclusion. The least ranks were scored by the Mon district of Nagaland and Kurung Kumey district of Arunachal Pradesh with FII value of 0.006 and 0.002, respectively. The Dakshina Kannada district of Karnataka, and Ariyalur district of Tamil Nadu, shifted from medium financial inclusion in 2015 (Figure 5) to low financial inclusion in 2016 (Figure 6).

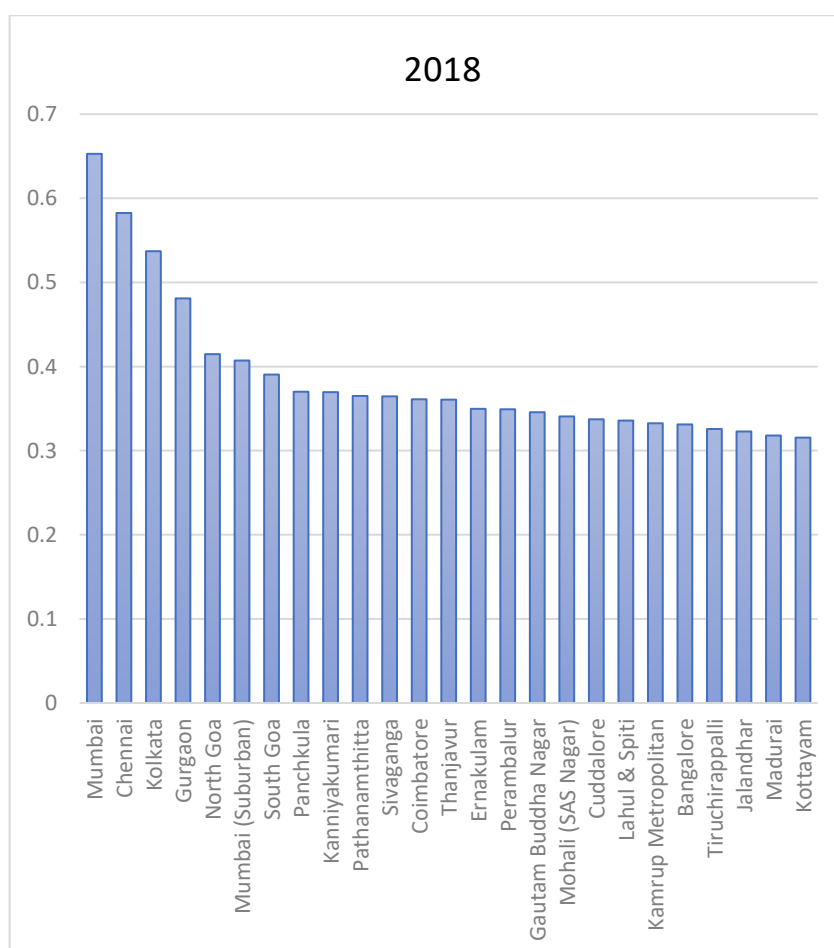
Figure 11: Top 25 Districts in 2016.



Source: Author's analysis

In 2018, from Figure 8 and Figure 12, the Mumbai district recorded the highest FII value of 0.653, followed by the Chennai district with FII value (0.583) and the Kolkata district with FII value (0.537), thus fall under the category of high financial inclusion. Further, Gurgaon district with FII value (0.481), North Goa district with FII value (0.415), Mumbai (Suburban) district with FII value (0.407), and South Goa district with FII value (0.390), along with 25 other districts fall under the category of medium financial inclusion. The Cuddalore, Tiruchirappalli, Madurai, Theni, Thiruvapur, Nagapattinam, and Khorda districts shifted from low financial inclusion in 2017 (Figure 7) to medium financial inclusion in 2018 (Figure 8). On the other hand, Kapurthala district with FII value (0.297), Tirunelveli district, and Bangalore Rural district with FII values, 0.292 and 0.291, respectively, and 564 other districts fall under the category of low financial inclusion. The least ranks were scored by Mon district of Nagaland and Kurung Kumey district of Arunachal Pradesh with FII values of 0.005 and 0.002, respectively.

Figure 12: Top 25 Districts in 2018.



Source: Author's analysis

4.1. High Financial Inclusion Districts

Figure 1 to Figure 12 shows the Mumbai district of Maharashtra, the Chennai district of Tamil Nadu, and the Kolkata district of West Bengal remained highly financially included districts across the Indian subcontinent from 2011 to 2018. The Hyderabad district's performance improved and entered under the category of highly financially included districts in 2014.

4.2. Medium Financial Inclusion Districts

Figure 1 to Figure 12 shows Gurgaon, Pathanamthitta, Ernakulam, Mumbai (Suburban), Perambalur, Kanyakumari, Lahul & Spiti, and Udipi districts remained the medium financially included districts across the Indian subcontinent from 2011 to 2018. Haryana's Panchkula district and Punjab's Jalandhar district remained the medium financially included district across the Indian subcontinent from 2013. The Bangalore and Sivaganga district's performance improved and entered under medium financially included districts from 2014. The Gautam Buddha Nagar, Thiruvananthapuram, Kottayam, Kamrup Metropolitan, Mohali (SAS Nagar), Solan, and Coimbatore districts, entered under medium financially included district from 2015.

4.3. Low Financial Inclusion Districts

Figure 1 to Figure 8 shows Nagapattinam, Theni, Madurai, Tiruchirappalli, Thiruvarur, Cuddalore, and Khorda districts remained the low financially included district across the Indian subcontinent until 2017. The Thanjavur district remained the low financially included district till 2016. The Kinnaur district entered under the category of low financially included districts from 2014. Kodagu district remained the low financially included district throughout the period, except in the year 2013. The Kapurthala district, except in 2016, remained the low financially included district. The Dakshina Kannada district remained the low financially included district throughout the period, except in 2015. The rest of the districts fall under low financial inclusion across the Indian subcontinent from 2011 to 2018.

Figure 1 to Figure 8 indicates that the bulk of Indian districts fall under the range of low FII status. Southern districts are doing much better in terms of financial inclusion than other districts. Much of the central, eastern, and north-eastern districts are doing poorly in terms of financial inclusion. A few districts increased the FII rank from low to medium throughout the study period. However, only the Hyderabad district managed to enter the high FII level from medium financial inclusion.

The research focuses not only on factors influencing the FII values for individual Indian districts but also on absolute specific statistical values at the aggregate level. Table 2 provides insightful

information on the calculated FII values for the Indian districts for the period 2011–2018. Descriptive figures show that there has been a modest increase in financial integration across districts over the years. The FII value ranged from 0.006 to 0.712 in 2011, while the FII value ranged from 0.002 to 0.653 in 2018. There is a marginal increase in the mean value from 0.121 in 2011 to 0.146 in 2018. In 2011, 593 districts were in the low FII category, which fell to 568 districts in 2017, and 12 districts were in the medium FII category in 2011, which rose to 29 districts in 2018.

Table 2: Descriptive Statistics of Indian districts

| Years | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Min. | 0.006 | 0.005 | 0.003 | 0.002 | 0.004 | 0.002 | 0.002 | 0.002 |
| Max. | 0.712 | 0.723 | 0.698 | 0.688 | 0.668 | 0.653 | 0.641 | 0.653 |
| Mean | 0.121 | 0.117 | 0.130 | 0.126 | 0.135 | 0.142 | 0.146 | 0.146 |
| S.D. | 0.077 | 0.075 | 0.080 | 0.077 | 0.081 | 0.077 | 0.076 | 0.080 |
| C.V. | 0.640 | 0.642 | 0.614 | 0.614 | 0.598 | 0.540 | 0.518 | 0.545 |
| Total Districts | 608 | 608 | 608 | 608 | 598 | 598 | 598 | 600 |
| High FII Districts | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 |
| Medium FII Districts | 12 | 10 | 16 | 12 | 21 | 20 | 20 | 29 |
| Low FII Districts | 593 | 595 | 589 | 592 | 574 | 575 | 575 | 568 |

Source: Author’s calculation

Further, Table 3 reports the FII and Human Development Index (HDI) ranking of Indian states. The result shows a positive association between FII and HDI but with few exceptions in north-eastern states. The past empirical studies reported similar results (Kuri & Laha, 2011; Kodan & Chhikara, 2013; Unnikrishnan & Jagannathan, 2015; Datta & Singh, 2019; Yadav et al., 2020).

Table 3: Indian states FII and HDI ranking for 2018

| State | FII Rank | HDI Rank |
|------------------|----------|----------|
| Goa | 1 | 2 |
| Tamil Nadu | 2 | 7 |
| Kerala | 3 | 1 |
| Punjab | 4 | 4 |
| Andhra Pradesh | 5 | 18 |
| Himachal Pradesh | 6 | 3 |
| Karnataka | 7 | 13 |
| Haryana | 8 | 6 |
| Tripura | 9 | 17 |
| Uttarakhand | 10 | 12 |
| Sikkim | 11 | 5 |
| Maharashtra | 12 | 9 |
| Jammu & Kashmir | 13 | 11 |
| West Bengal | 14 | 19 |

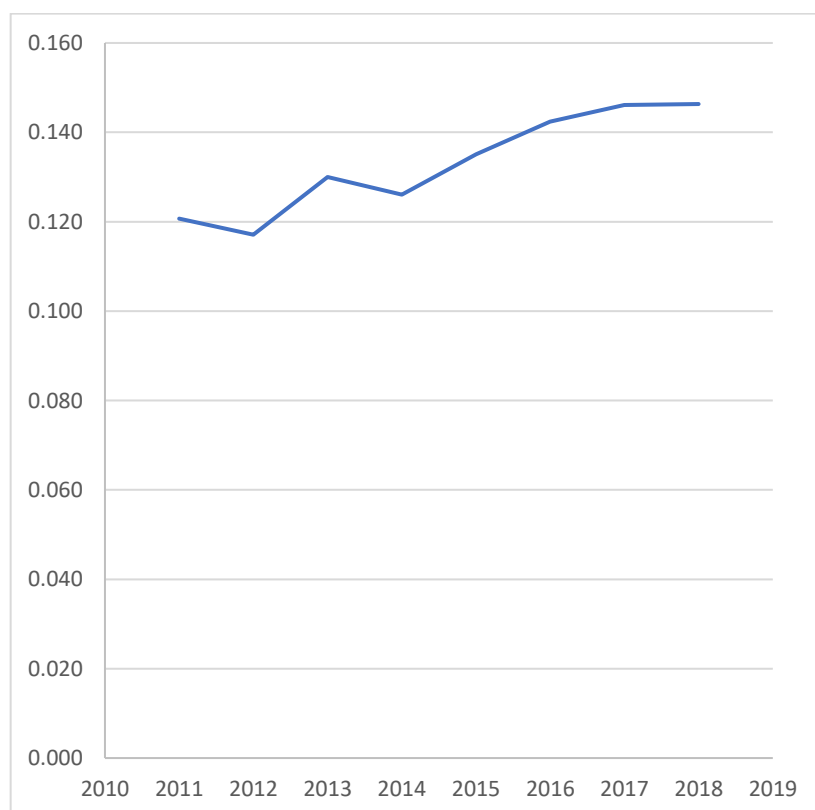
| | | |
|-------------------|----|----|
| Gujarat | 15 | 15 |
| Mizoram | 16 | 8 |
| Odisha | 17 | 24 |
| Rajasthan | 18 | 20 |
| Assam | 19 | 21 |
| Madhya Pradesh | 20 | 23 |
| Uttar Pradesh | 21 | 26 |
| Jharkhand | 22 | 25 |
| Chhattisgarh | 23 | 22 |
| Arunachal Pradesh | 24 | 16 |
| Bihar | 25 | 27 |
| Manipur | 26 | 10 |
| Nagaland | 27 | 14 |

Source: Author’s calculation & Global Data Lab.

4.4. Impact assessment of PMJDY

In 2014, GoI introduced PMJDY for the financial inclusion of Indian Citizens. Empirical results (Figure 1 to 8) reveal that only a few districts have increased their rank from low to medium financial inclusion. Figure 13 illustrates that there is just a marginal improvement in the FII for all of India since 2014.

Figure 13: FII for India (2011-2018).



Source: Author’s analysis

Before launching PMJDY, 12 districts were in the medium FII category in 2014, which rose to 20 medium financially included districts in 2016, further increasing to 29 districts in 2018 (Table 2).

Moreover, it can be inferred that the PMJDY framework has not driven the economy towards a high degree of financial inclusion. The PMJDY framework's failure to help districts move from a low to a high degree of financial inclusion can be understood from the fact that each PMJDY account holder is provided with a Rupay debit card for usage purposes. However, there is still only a slight percentage growth in the use of a debit card or credit card for payments from 11.107 percent in 2014 to 12.335 percent in 2017. Subsequently, there is a decrease in bank accounts receiving government transfers from 9.822 percent in 2014 to 8.205 percent in 2017, due to which also the number of bank accounts rose from 22.037 percent in 2014 with no deposit and no withdrawal to 38.716 percent in 2017, respectively (Table 4).

Table 4: Financial inclusion indicators of India

| Indicator Name | 2011 | 2014 | 2017 |
|--|--------|--------|--------|
| Account (% age 15+) | 35.232 | 53.142 | 79.875 |
| Borrowed any money in the past year (% age 15+) | | 47.788 | 42.391 |
| Borrowed for health or medical purposes (% age 15+) | | 21.114 | 13.820 |
| Borrowed from a financial institution (% age 15+) | 7.697 | 6.369 | 6.617 |
| Coming up with emergency funds: not possible (% age 15+) | | 49.370 | 51.856 |
| Credit card ownership (% age 15+) | 1.767 | 4.175 | 3.004 |
| Debit card ownership (% age 15+) | 8.400 | 22.068 | 32.722 |
| Financial institution account (% age 15+) | 35.232 | 52.754 | 79.840 |
| Made or received digital payments in the past year (% age 15+) | | 19.311 | 28.693 |
| Main source of emergency funds: family or friends (% able to raise funds, age 15+) | | 36.481 | 47.886 |
| Mobile money account (% age 15+) | | 2.352 | 1.995 |
| No deposit and no withdrawal from a financial institution account in the past year (% age 15+) | | 22.037 | 38.716 |
| Outstanding housing loan (% age 15+) | | 3.652 | 4.645 |
| Paid utility bills in the past year (% age 15+) | | 39.400 | 41.824 |
| Received digital payments in the past year (% age 15+) | | 11.612 | 16.459 |
| Received domestic remittances in the past year (% age 15+) | | 9.787 | 15.756 |
| Received government transfers in the past year (% age 15+) | | 9.822 | 8.205 |
| Saved any money in the past year (% age 15+) | | 38.276 | 33.557 |
| Sent domestic remittances in the past year (% age 15+) | | 9.944 | 11.257 |
| Used a debit or credit card to make a purchase in the past year (% age 15+) | | 11.107 | 12.335 |
| Withdrawal in the past year (% with a financial institution account, age 15+) | | 41.702 | 42.951 |

Source: The World Bank and Yadav et al. 2020.

5. Conclusion

This paper derived the financial inclusion index (FII) on the lines of the UNDP HDI measure. The proposed FII could survey the degree of financial inclusion across Indian locale and screen various areas' advancement over time. The district-wise FII is calculated from 2011 to 2018, demonstrating that India's districts are at various financial inclusion levels. The proposed FII involved three new dimensions: the number of commercial bank branches per 1000 sq. Km, the number of agricultural credit accounts per 1000 population, and the number of non – agricultural credit accounts per 1000 population that were not used in the previous studies at the sub-national level.

The value of the FII appears to reflect a modest increase in the degree of financial inclusion across districts from 2011–2018. The mean FII value rose from 0.121 in 2011 to 0.146 in 2018, with most central, eastern, and north-eastern districts doing poorly in financial inclusion and being under low financial inclusion. The PMJDY framework's failure to help districts move from low to high financial inclusion could be seen from the fact that there is only a slight percentage increase in the use of debit card or credit card payments from 11.107 percent in 2014 to 12.335 in 2017. Subsequently, there is a decrease in bank accounts receiving government transfers from 9.822 percent in 2014 to 8.205 percent in 2017, due to which also the number of bank accounts rose from 22.037 percent in 2014 with no deposit and no withdrawal to 38.716 percent in 2017, respectively. Subsequently, underlying changes are legitimized in the institutional setting. The study proposes that financial inclusiveness needs a coherent strategy that includes a systemic revision of the financial system and strengthening and expanding financial institutions concentrating particularly in backward areas, where government action is required, simultaneously tackling digital literacy by creating awareness, which will further increase the demand for financial services.

The lack of data availability on the different aspects of financial inclusion is a significant weakness of the study, further expanding with future data. The impact evaluation of financial inclusion on poverty reduction and economic growth can also be examined from a policy viewpoint.

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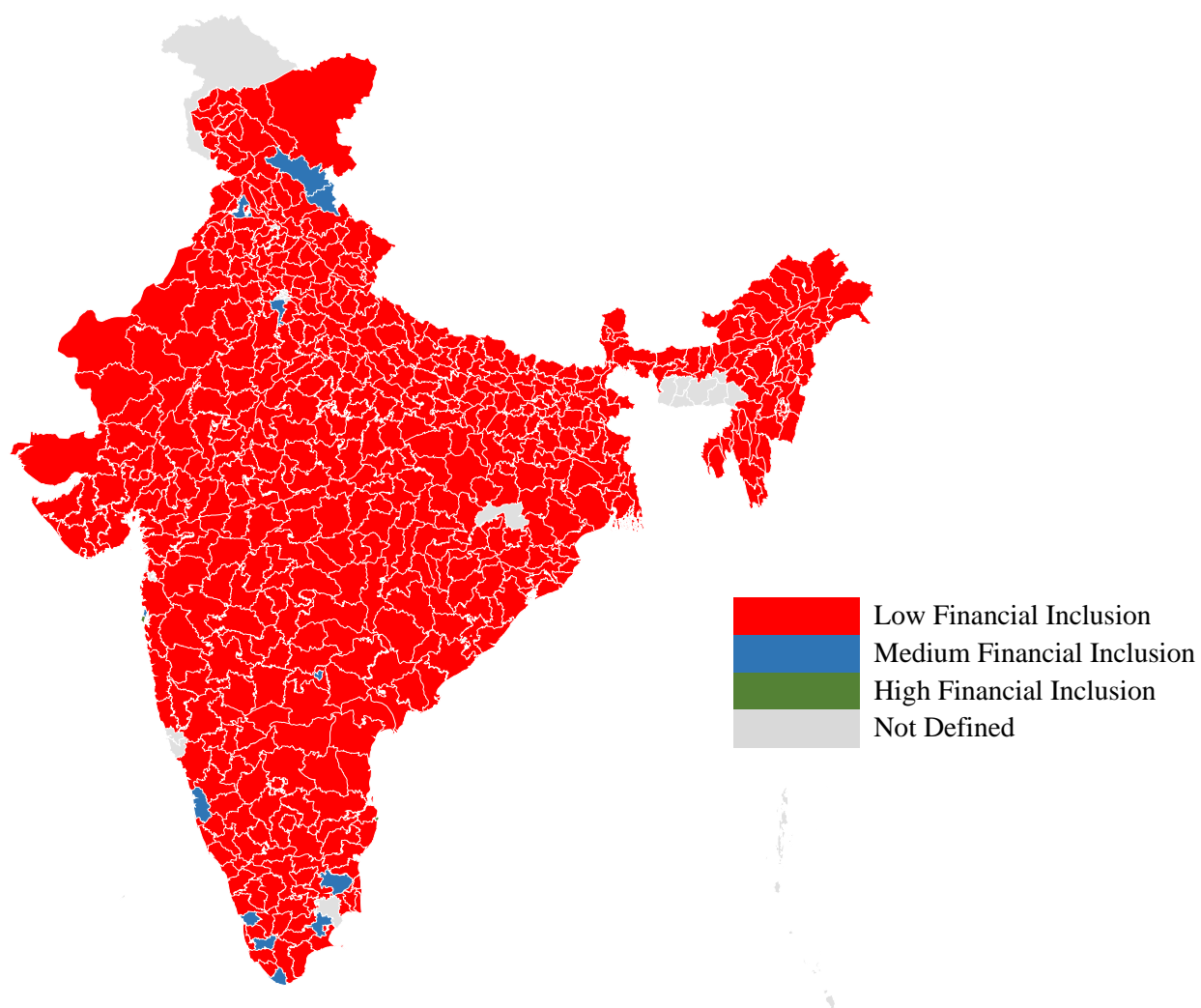
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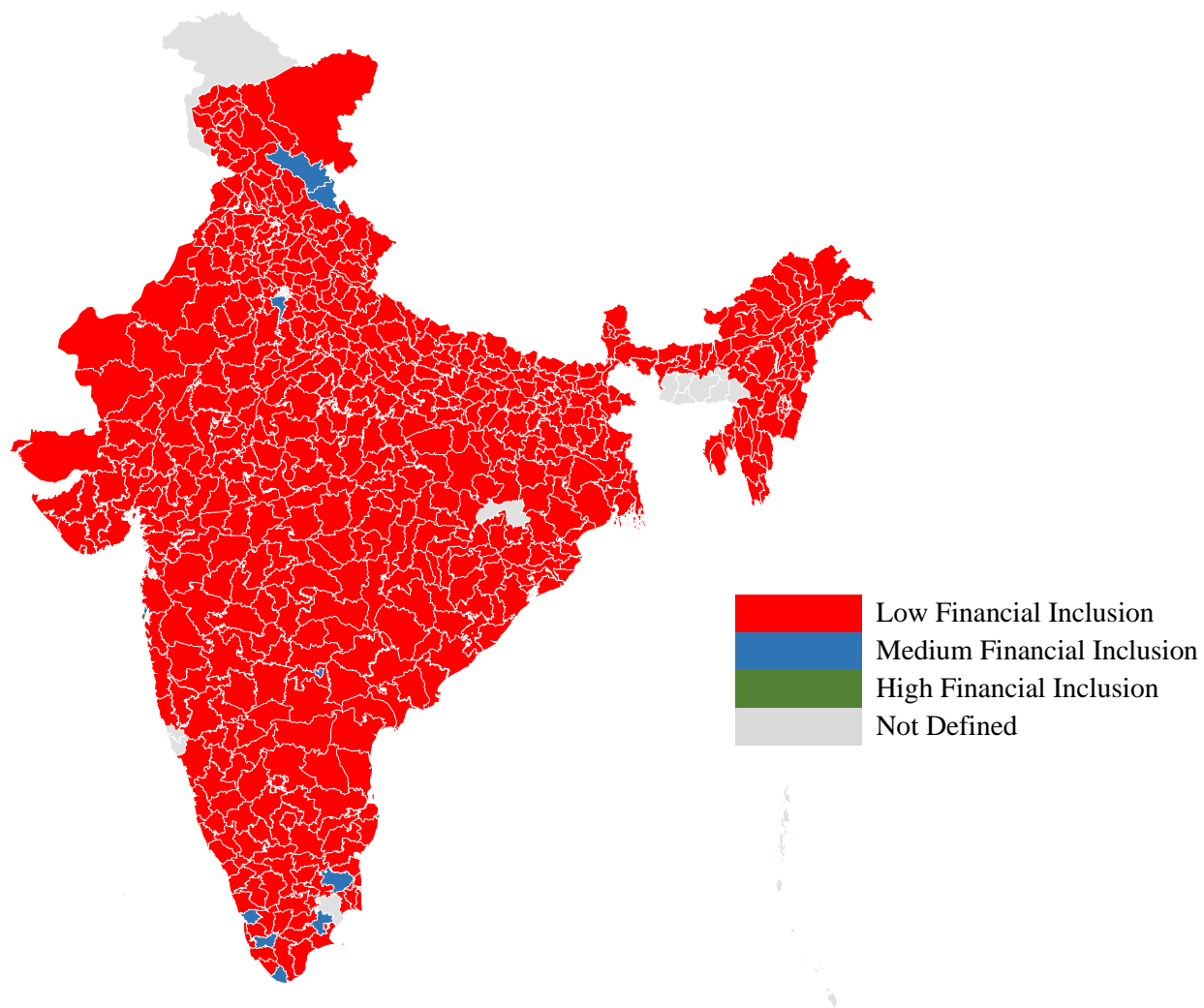
Appendix

Figure 1: Financial Inclusion Index District-Wise, 2011.



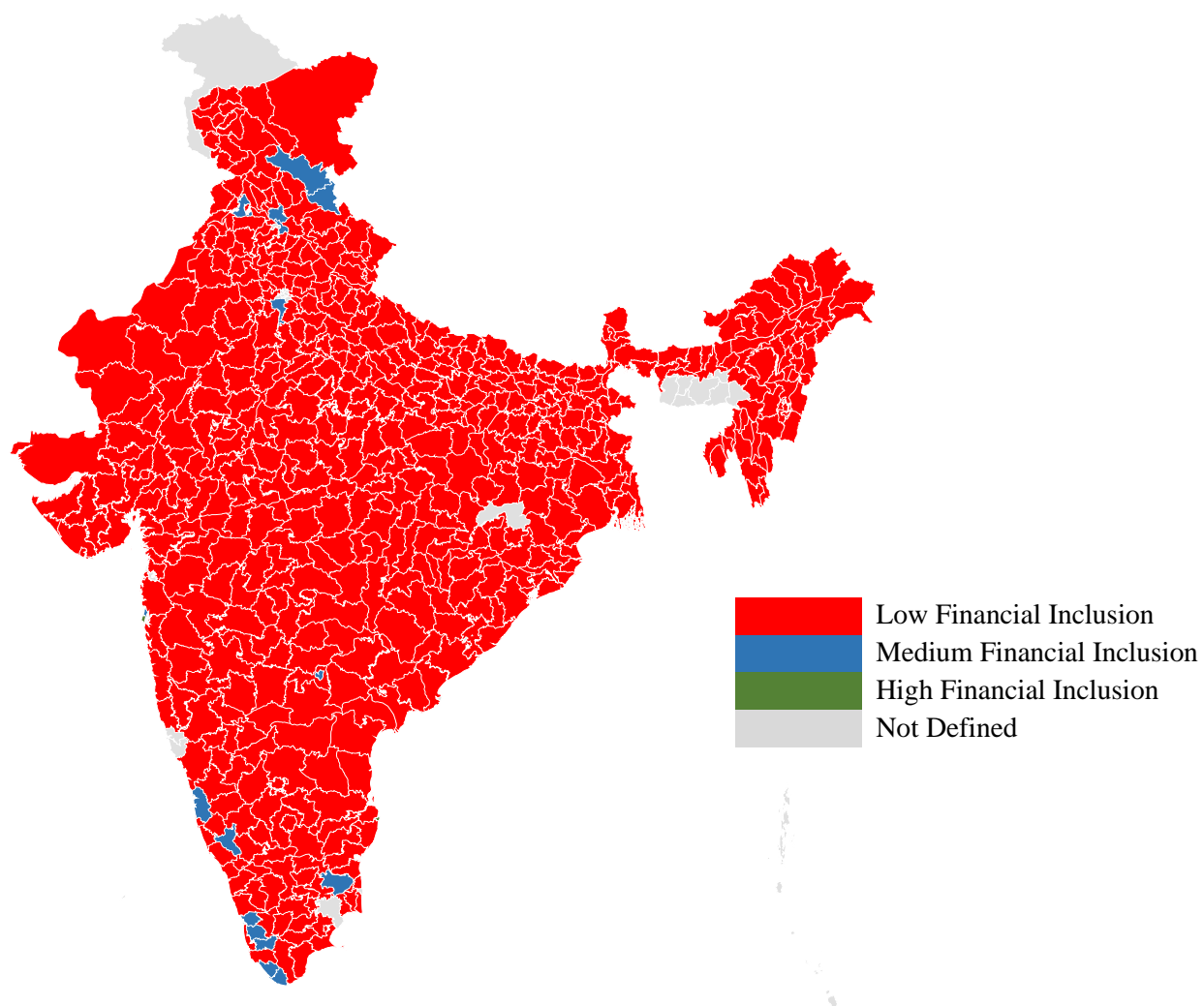
Source: Author's Calculation

Figure 2: Financial Inclusion Index District-Wise, 2012.



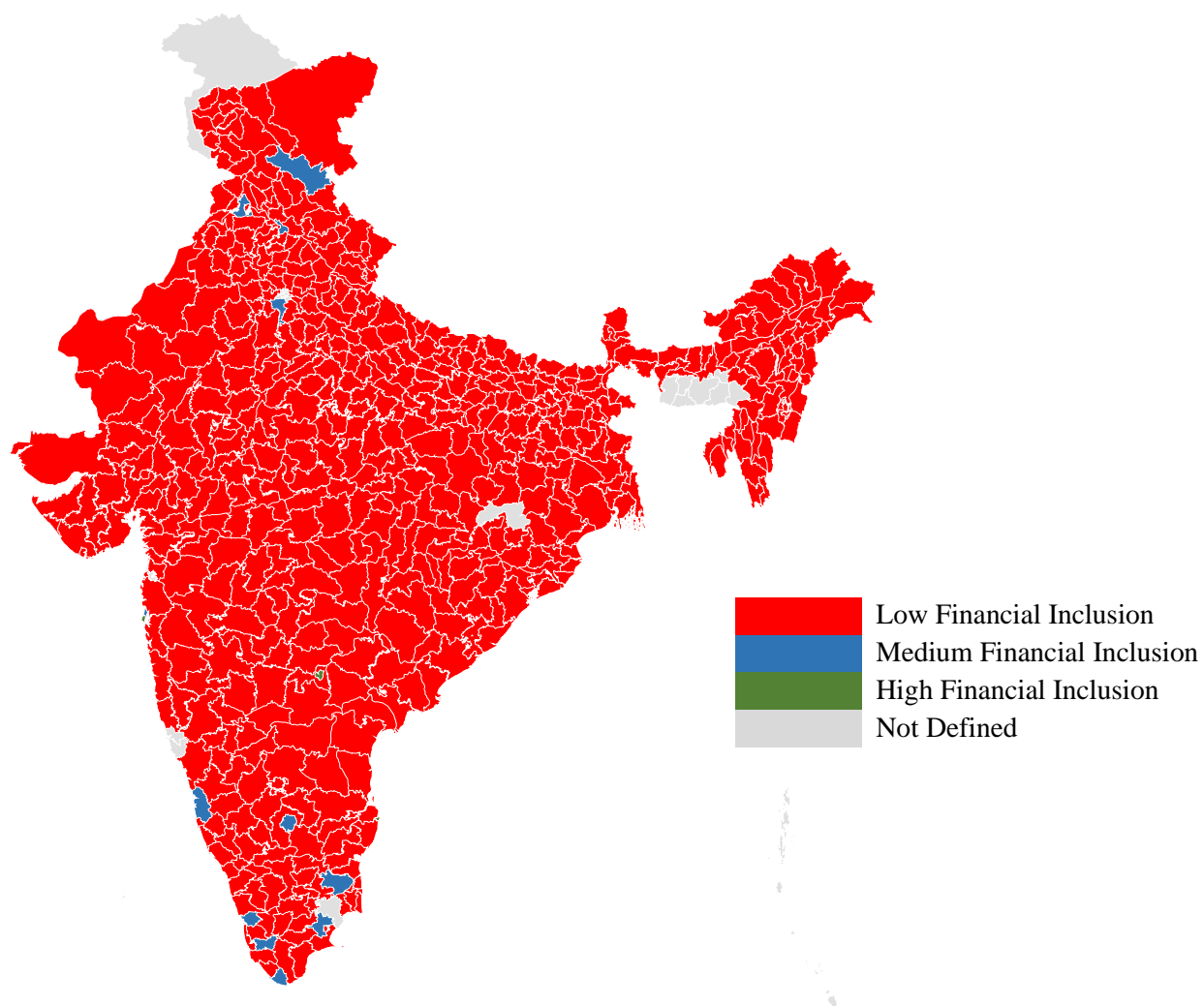
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Figure 3: Financial Inclusion Index District-Wise, 2013.



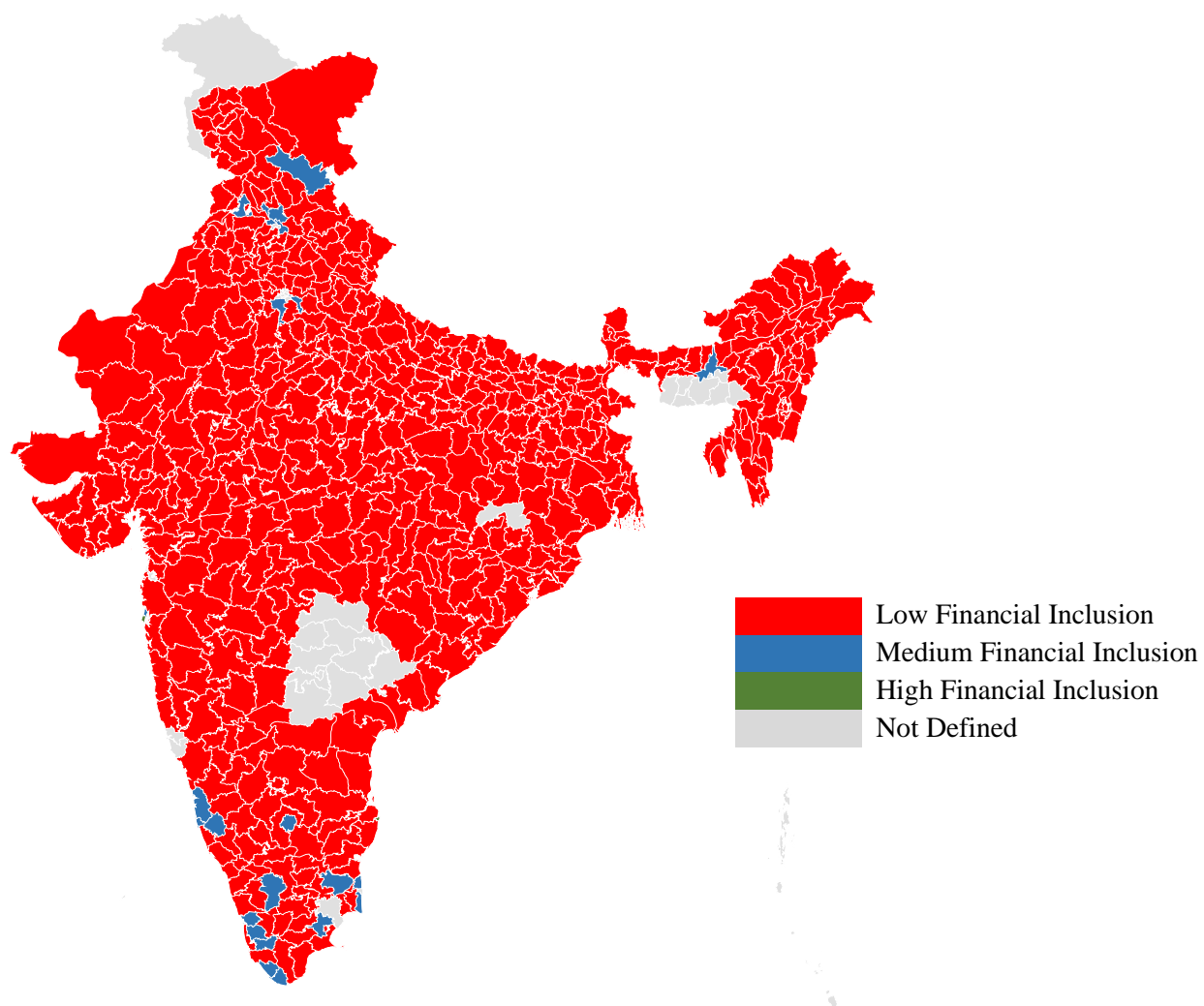
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Figure 4: Financial Inclusion Index District-Wise, 2014.



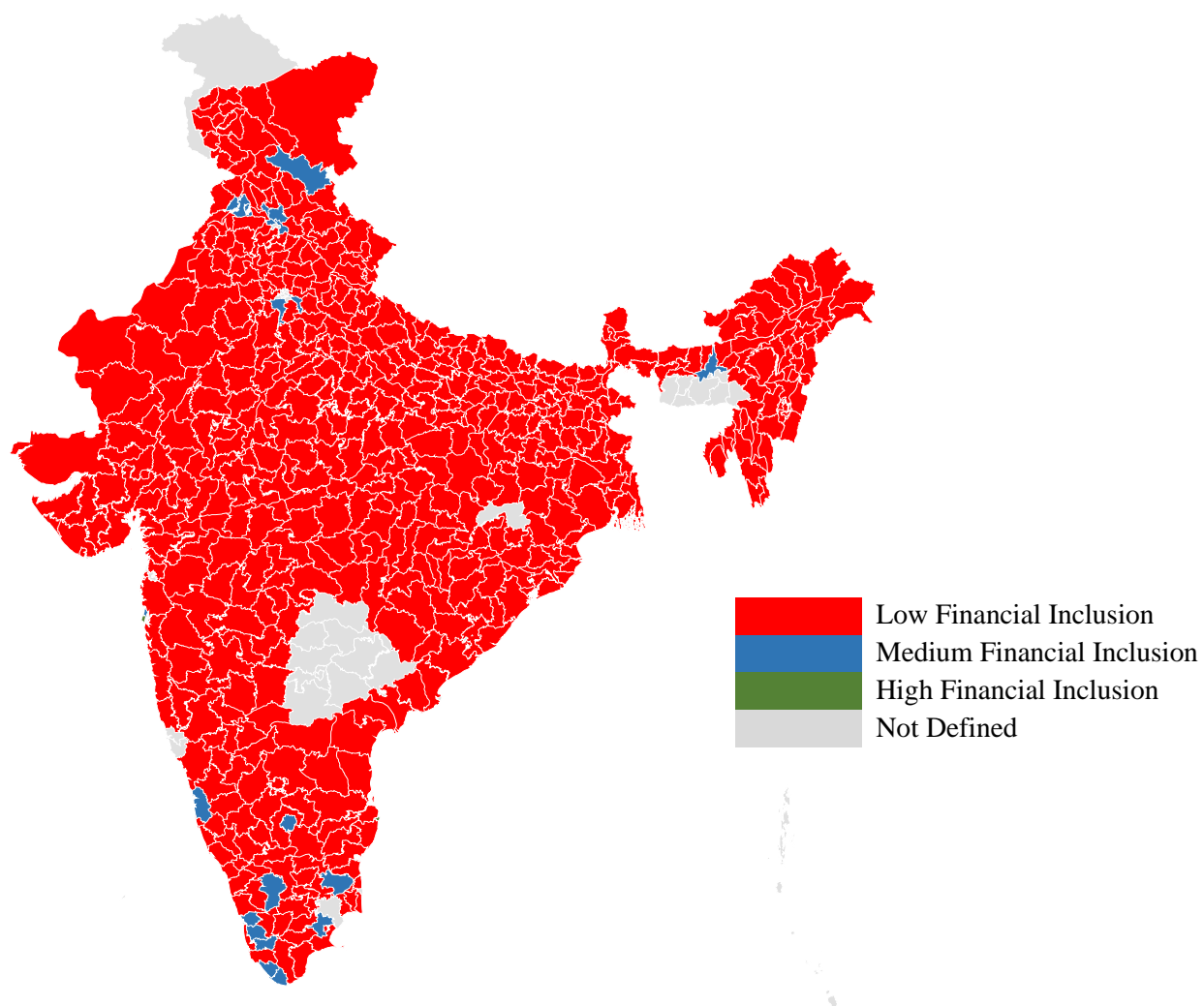
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Figure 5: Financial Inclusion Index District-Wise, 2015.



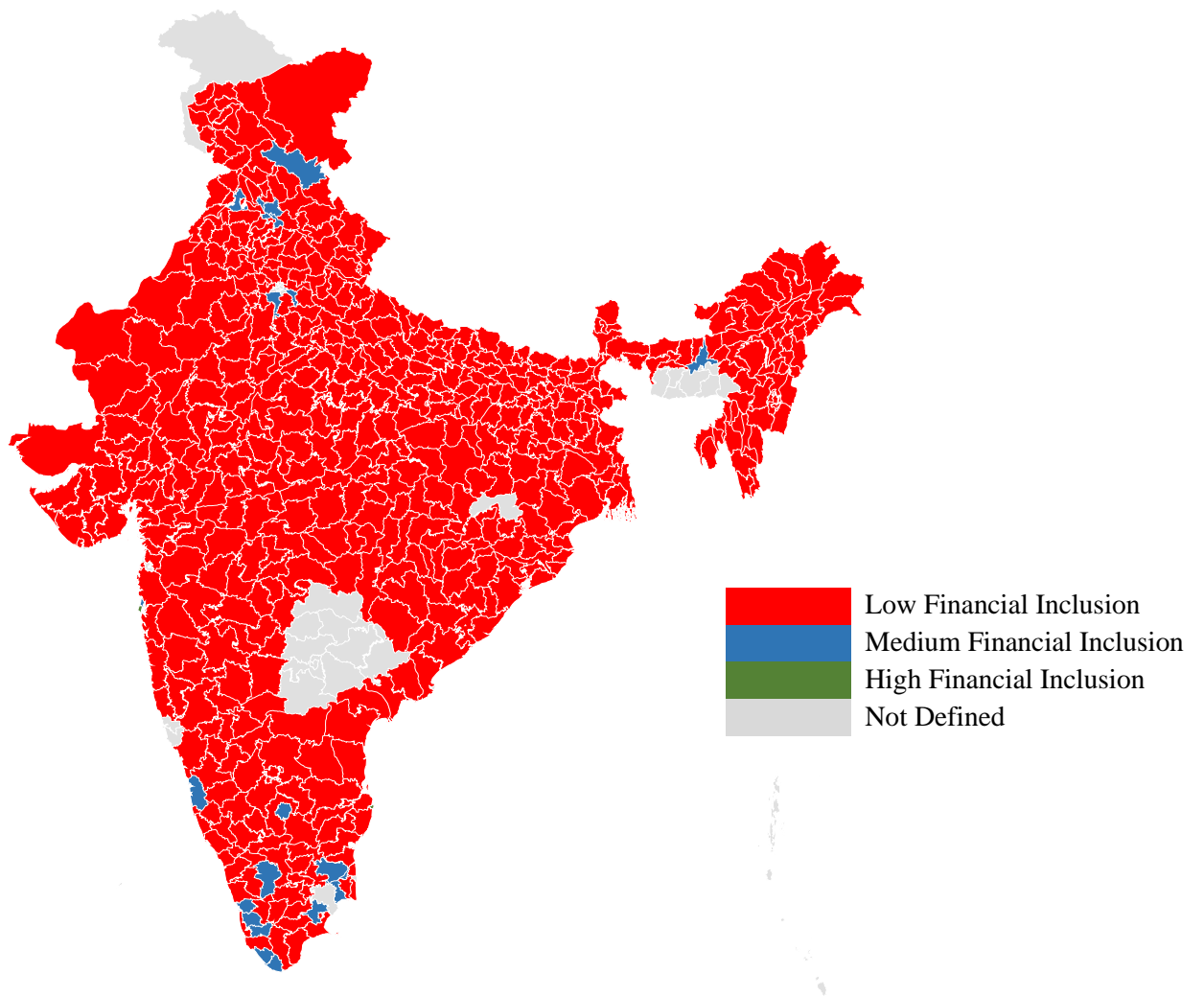
Source: Author's Calculation

Figure 6: Financial Inclusion Index District-Wise, 2016.



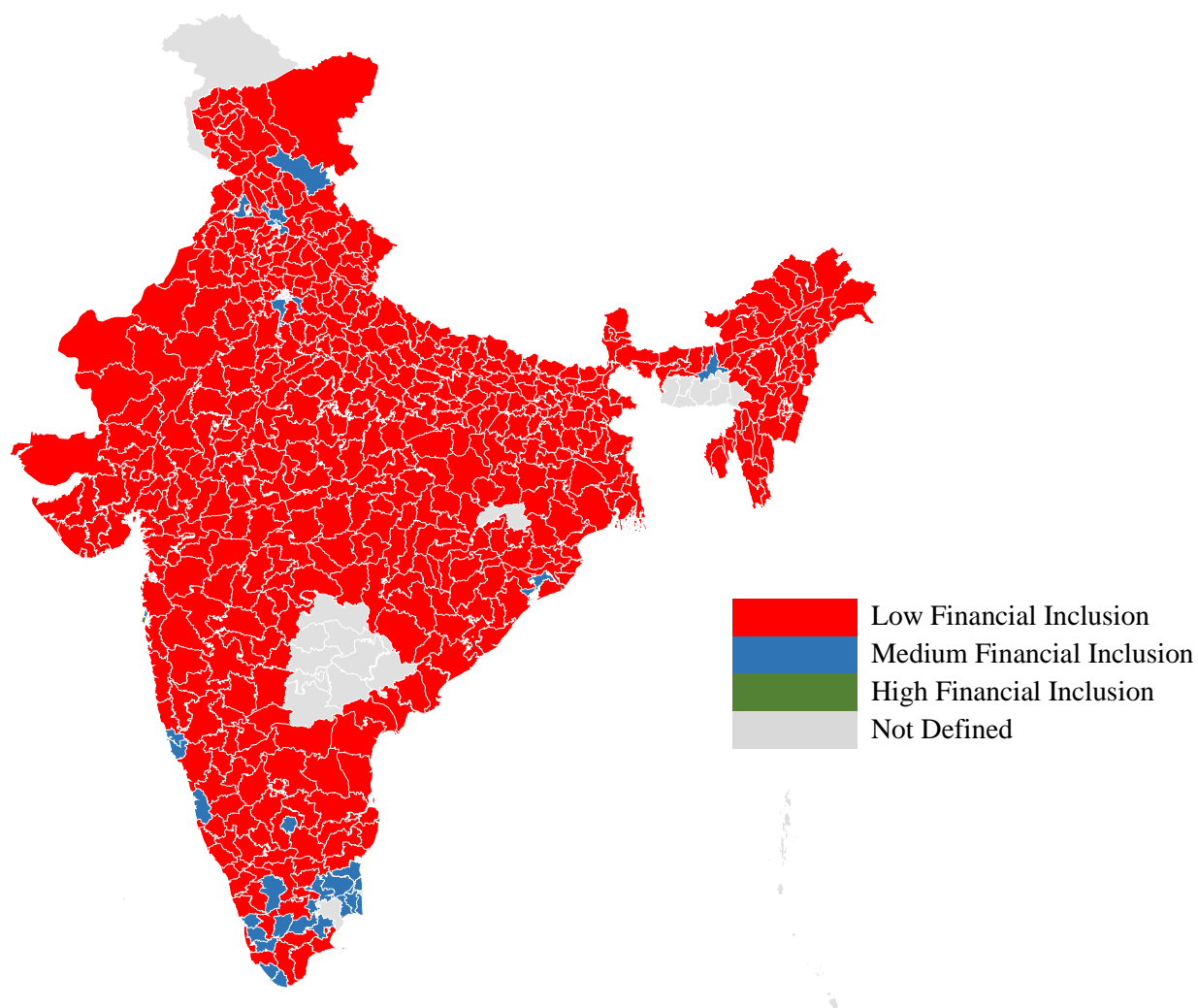
Source: Author's Calculation

Figure 7: Financial Inclusion Index District-Wise, 2017.



Source: Author's Calculation

Figure 8: Financial Inclusion Index District-Wise, 2018.



Source: Author's Calculation