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

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Abstract

The study builds up a financial inclusion index (FII) across districts of 27 Indian states 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 with only a couple of areas improving their rank from low to medium financial inclusion. Subsequently, underlying changes are legitimized in the institutional setting by fortifying and growing monetary organizations and all the 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 is the result of 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 to 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's key results suggest that the FII indicator's level appears to reflect a slight increase in financial inclusion during 2011–2018. Most locale 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 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 India 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 (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 (2012) methodology constructed a 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 a FII using demand and supply-side indicators, separately. The study's significant finding is that the southern and western states are performing better in terms of 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 a 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 a 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, **Deepti and Vaidhyasubramaniam (2018)**, utilizing Sarma (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 the value of indicators.

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 (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 (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 position in 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. There is likewise a dearth of a far-reaching study that investigates government plans' viability, especially the PMJDY, in-financial inclusion throughout its inception at 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 here}

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 the construction of FII.

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:

$$\boldsymbol{d_i = w_i^*\left[\frac{A_i - m_i}{M_i - m_i}\right]} \qquad \textbf{(1)}$$

Here,

- wi, represents weight assigned to the dimension i, that lie between 0 and 1.
- Ai, represents the actual value of dimension i.
- mi, represents the minimum value of dimension i.
- Mi represents the maximum value of dimension i.
- di represents dimensions of financial inclusion i.

In the respective dimension, the greater the value of di signifies greater attainment of inclusion. Each point X = (1, 2, 3 ...) will represent the n dimensions of financial inclusion. The point W = (1, 2, 3 ...) represents the best condition while point 0 = (0, 0, 0, 0 ... 0) 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:

$$X_1 = \frac{\sqrt{d_1^2 + d_2^2 + d_3^2 + \cdots + d_n^2}}{\sqrt{w_1^2 + w_2^2 + w_3^2 + \ldots + w_n^2}} \tag{2}$$

Formula 3:

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

Formula (2) and (3) determine the Euclidian and inverse Euclidian distance of X from 0 and W. The lower value of X_1 and X_2 corresponds to low financial inclusion and vice – versa.

Formula 4:

$$FII = (X_1 + X_2)/2 \tag{4}$$

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 represents the results of India's district-wise financial inclusion index for the period 2011-2018.

[Figure 1 to 8 near here]

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. The least ranks scored by Mon and Kiphire districts of Nagaland with FII value of 0.008, and 0.006, respectively.

[Figure 9 near here]

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, and 589 other districts fall under the category of low financial inclusion. The least ranks 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 near here]

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 scored by 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 near here]

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, Thiruvarur, 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 scored by Mon district of Nagaland and Kurung Kumey district of Arunachal Pradesh with FII value of 0.005, and 0.002, respectively.

[Figure 12 near here]

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 Udupi 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 near here]

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 near here]

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. 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 failure of the PMJDY framework 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 purpose, but still, there is 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).

[Figure 13 near here]

[Table 4 near here]

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.

References

Ali, J., & Khan, M. A. (2020). Micro and Macro financial inclusion and their impacts on economic growth: Evidence from Asian economies with alternative approaches. International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies, 11(5), 1–15.

Ambarkhane, D., Singh, A. S., & Vekataramani, B. (2016). Measuring financial inclusion of Indian states. International Journal of Rural Management, 12(1), 72–100.

Bagli, S., & Papita, D. (2012). A Study of Financial Inclusion in India. Radix International Journal of Economics and Business Management, 1(8), 1–18.

Camara, N., & David, T. (2014). Measuring Financial Inclusion: A Multidimensional Index. (BBVA Working Paper 14/26).

Charkravarty, S. R., & Pal, R. (2010). Measuring financial inclusion: An Axiomatic Approach. (IGIDR Working Paper). Mumbai.

Chattopadhyay, S. K. (2011). Financial Inclusion in India: A Case Study of West Bengal. (RBI Working Paper). Mumbai.

Crisil. (2018). Financial inclusion surges driven by Jan–Dhan Yojana. Crisil Inclusix, 4, 1–86.

Datta, S. K., & Singh, K. (2019). Variation and determinants of financial inclusion and association with human development: A cross country analysis. IIMB Management Review, 31, 336–349.

Deepti, N. S., & Vaidhyasubramaniam, S. (2018). Measure of Index on Financial Inclusion in India. International Journal of Pure and Applied Mathematics, 119(10), 1447–1454.

Goel, S., & Sharma, R. (2017). Developing a financial inclusion index for India. Procedia Computer Science, 122, 949–956.

Gupta, A., Chotia, V., & Rao, N. V. M. (2014). Financial inclusion and human development: A State-wise analysis from India. International Journal of Economics, Commerce and Management, 2(5), 1–23.

Gupte, R., Venkataramani, B., & Gupta, D. (2012). Computation of financial inclusion index for India. Procedia: Social and Behavioral Sciences, 37, 133 – 149.

Kainth, G.S. (2011). Developing an Index of Financial Inclusion, Retrieved from https://www.findevgateway.org/paper/2011/12/developing-index-financial-inclusion.

Kaur, P., & Abrol, V. (2018). Measuring financial inclusion in Jammu & Kashmir state: An empirical study. IOSR Journal of Business and Management, 20(1), 37–44.

Kodan, A. S., & Chhikara, K. S. (2013). A theoretical and quantitative analysis of financial inclusion and economic growth. Management and Labour Studies, 38(1–2), 103–133.

Kuri, P. K., & Laha, A. (2011). Financial inclusion and human development in India: An inter-state analysis. Indian Journal of Human Development, 5(1), 61–78.

Laha, A., & Kuri, P. K. (2014). Demand for and supply of financial inclusion in India; an inter-state analysis. ELK Asia Pacific Journal of Finance and Risk Management, 5(1), 1–18.

Lucas, R. E. (1988). On the mechanics of economic development. Journal of Monetary

Economics, 22(1), 3–42.

Nwidobie, B. M. (2019). Financial inclusion index in Nigeria: An exploratory analysis. International Journal of Publication and Social Studies, 4 (1), 26–36.

Pham, T. T. T., Nguyen, T. V. H., & Nguyen, K. (2019). Does bank competition promote financial inclusion? A cross-country evidence. Applied Economics Letter, 26(13), 1133–1137.

Piñeyro, C. M. Z. (2013). Financial inclusion index: Proposal of multidimensional measure for Mexico. The Mexican Journal of Economics and Finance, 8(2), 157–180.

Poonam, A. C. (2016). Financial inclusion in India: A state level study. SSRG International Journal of Economics and Management Studies, 3(2), 1 – 4.

Rangarajan, C. (2008). Report of the Committee on Financial Inclusion. Ministry of Finance, Government of India.

Robinson, J. (1952). The rate of interest and other essays. London: MacMillan.

Sarma, M. (2008). Index of financial inclusion. (ICRIER, Working Paper No. 215). New Delhi.

Sarma, M. (2012). Index of financial inclusion–a measure of financial sector inclusiveness. (Competence Center, Working Paper No. 07). Berlin.

Schumpeter, J. A. (1911). The theory of economic development. Cambridge: Harvard University Press.

Sethy, S. K. (2016). Developing a financial inclusion index and inclusive growth in India. Theoretical and Applied Economics, 23(02), 187–206.

Sethy, S. K., & Goyari, P. (2018). Measuring financial inclusion of Indian States: An empirical study. Indian Journal of Economics and Development, 14(1), 447–454.

Sha'ban, M., Girardone, C., & Sarkisyan, A. (2020). Cross-country variation in financial inclusion: A global perspective. The European Journal of Finance, 26(4–5), 319–340.

Singh, B. P., & Mishra, A. K. (2014). Nexus of financial development and economic growth in India: revisiting Schumpeter. Indian Journal of Economics and Development, 10(3), 246–255.

Singh, B. P., & Mishra, A. K. (2015). Researching the relationship between Financial and Real sectors in India. Indian Journal of Economics and Development, 11(4), 861–868.

Singh, S., & Sarkar, A. K. (2020). Index of Financial Inclusion (IFI) and banking penetration in Jharkhand. Purakala, 31(12), 749–757.

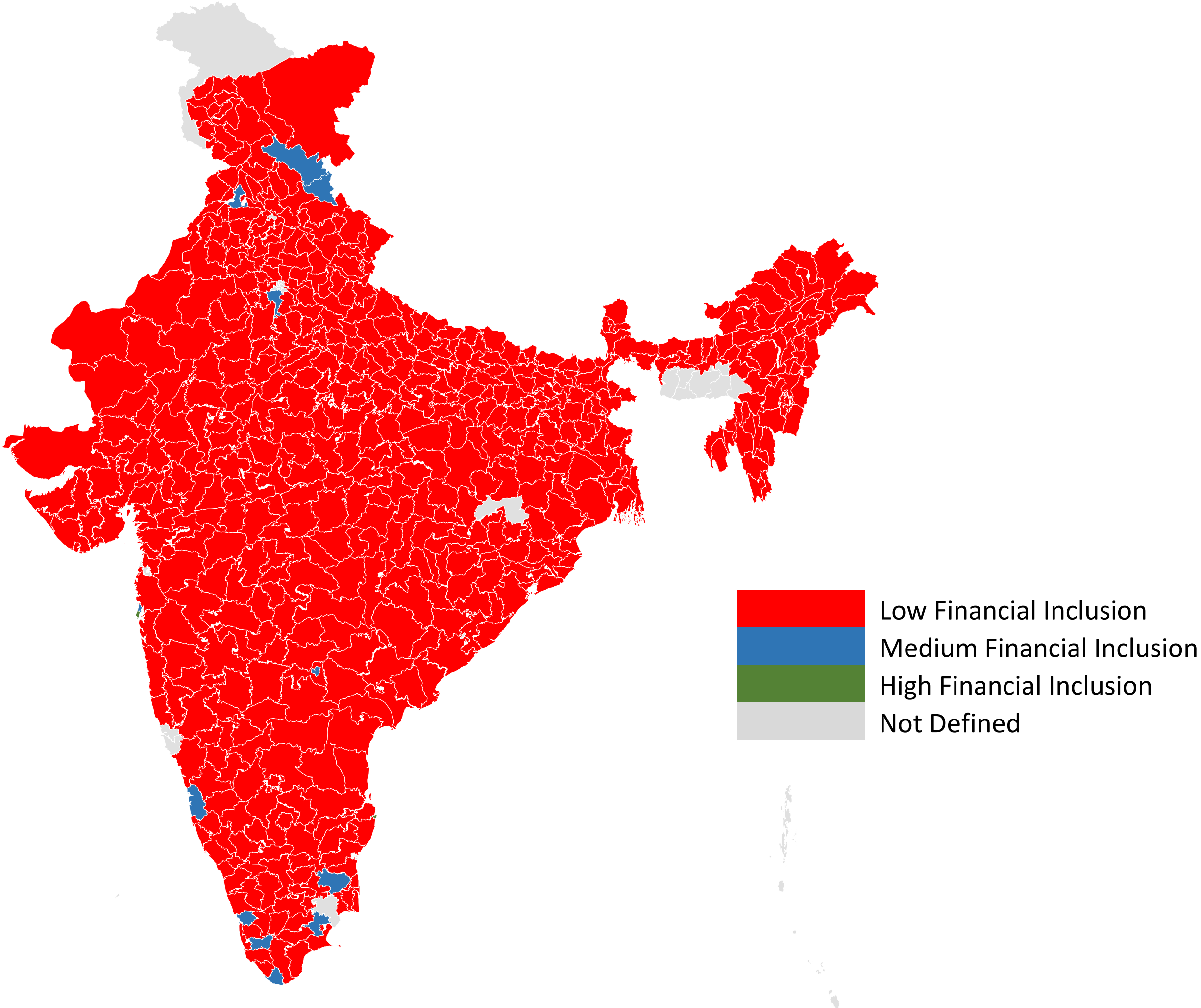
Unnikrishnan, R., & Jagannathan, L. (2015). Unearthing global financial inclusion levels and analysis of financial inclusion as a mediating factor in global human development. Serbian Journal of Management, 10(1), 19–32.

Yadav, V., Singh, B.P., & Velan, N. (2020). Multidimensional financial inclusion index for Indian states. Journal of Public Affairs. https://doi.org/10.1002/pa.2238.

Yorulmaz, R. (2013). Construction a regional financial inclusion index in Turkey. Retrieved from https://www.bddk.org.tr/ContentBddk/BddkDergiEng/dergi_00013_06.pdf.

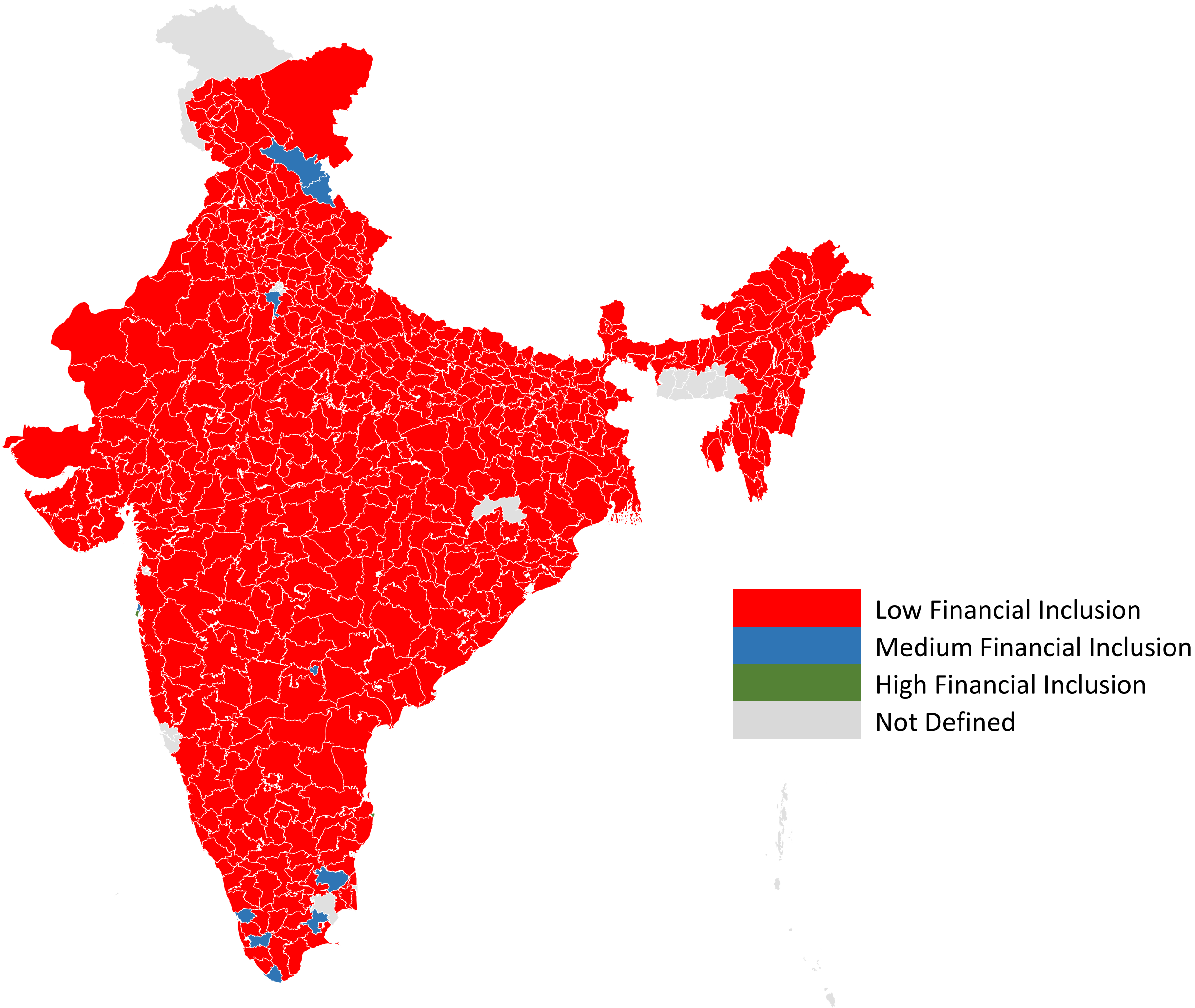
Appendix

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



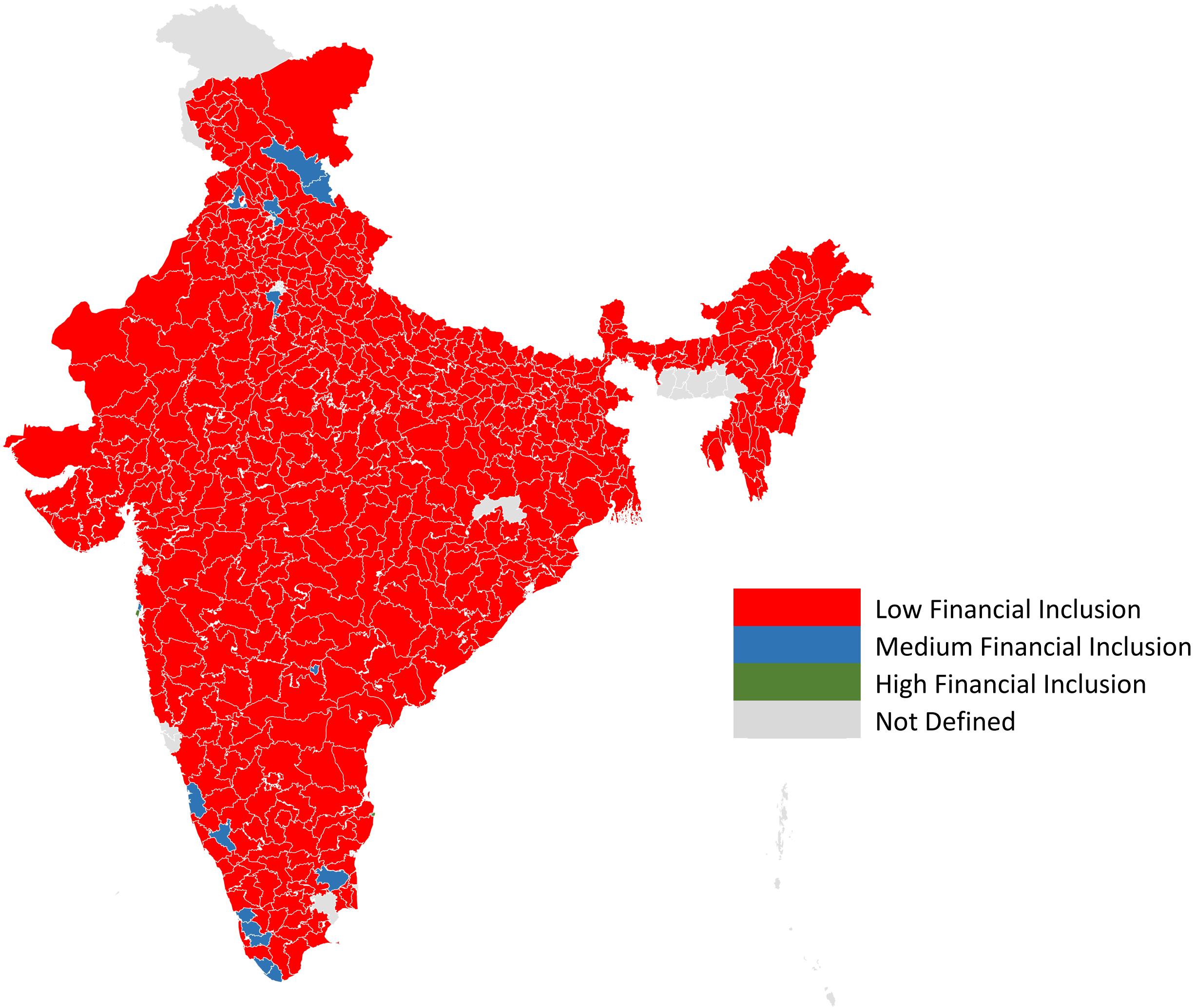
Source: Author’s Calculation

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



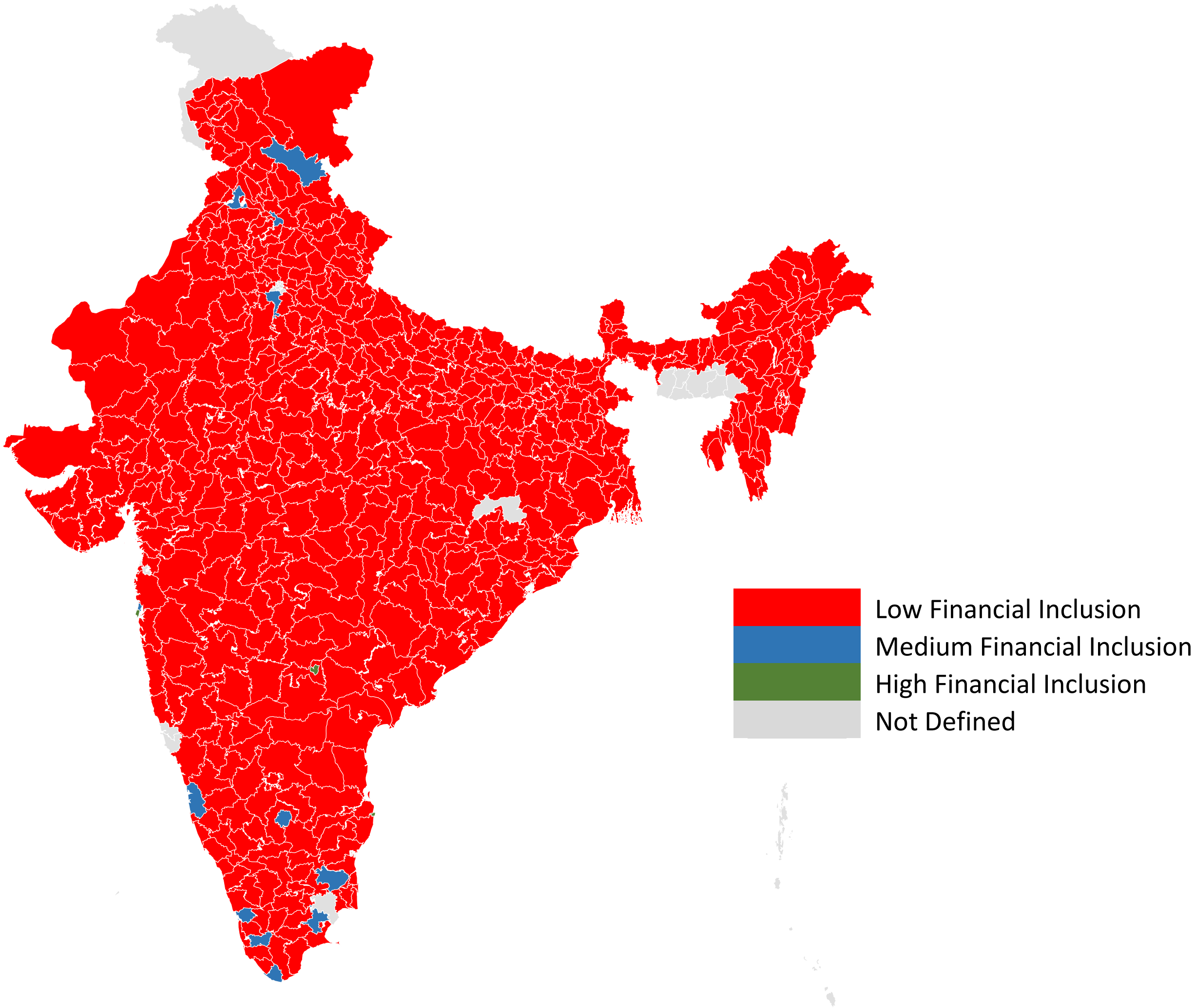
Source: Author's Calculation

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



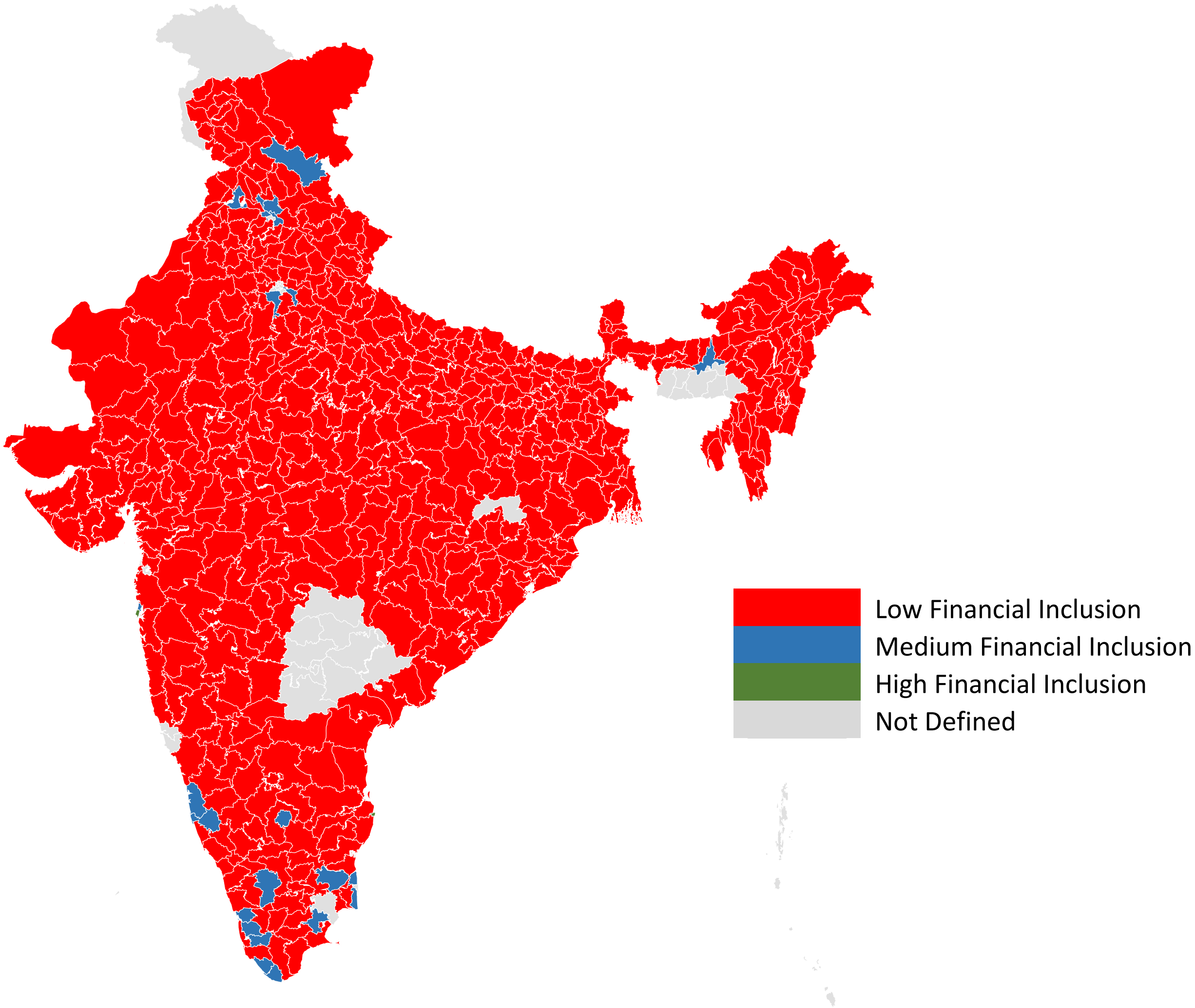
Source: Author's Calculation

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



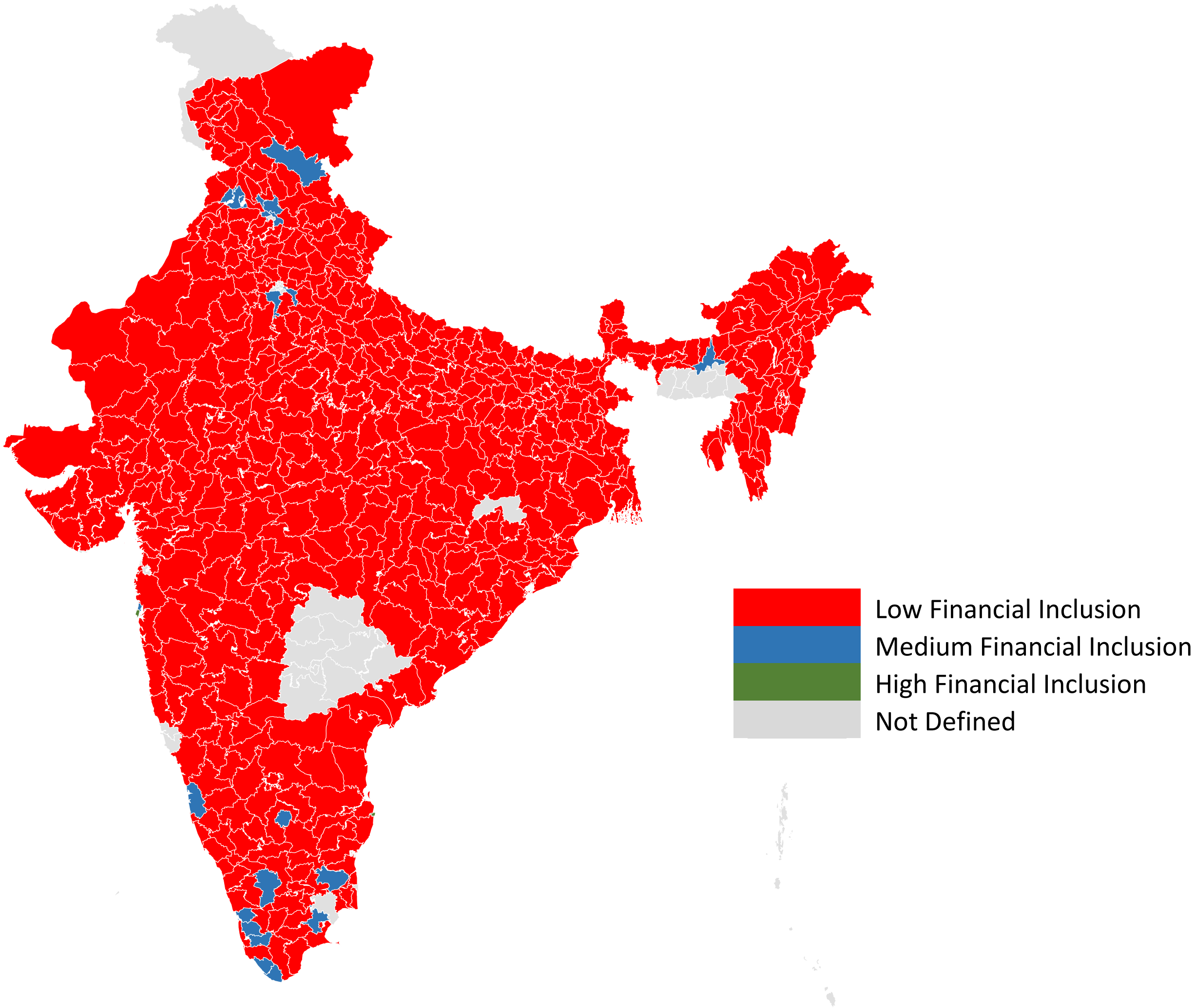
Source: Author’s Calculation

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



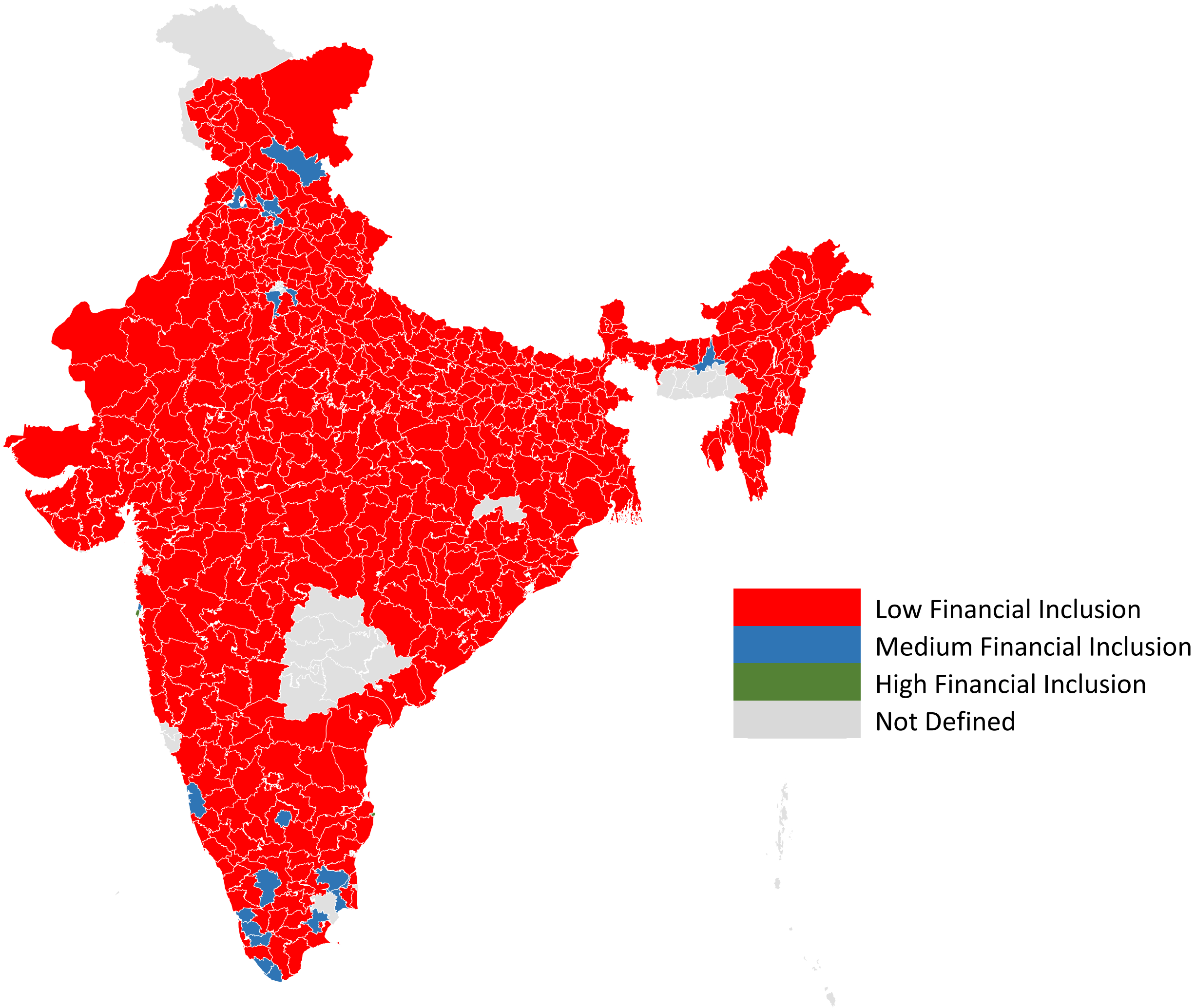
Source: Author's Calculation

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



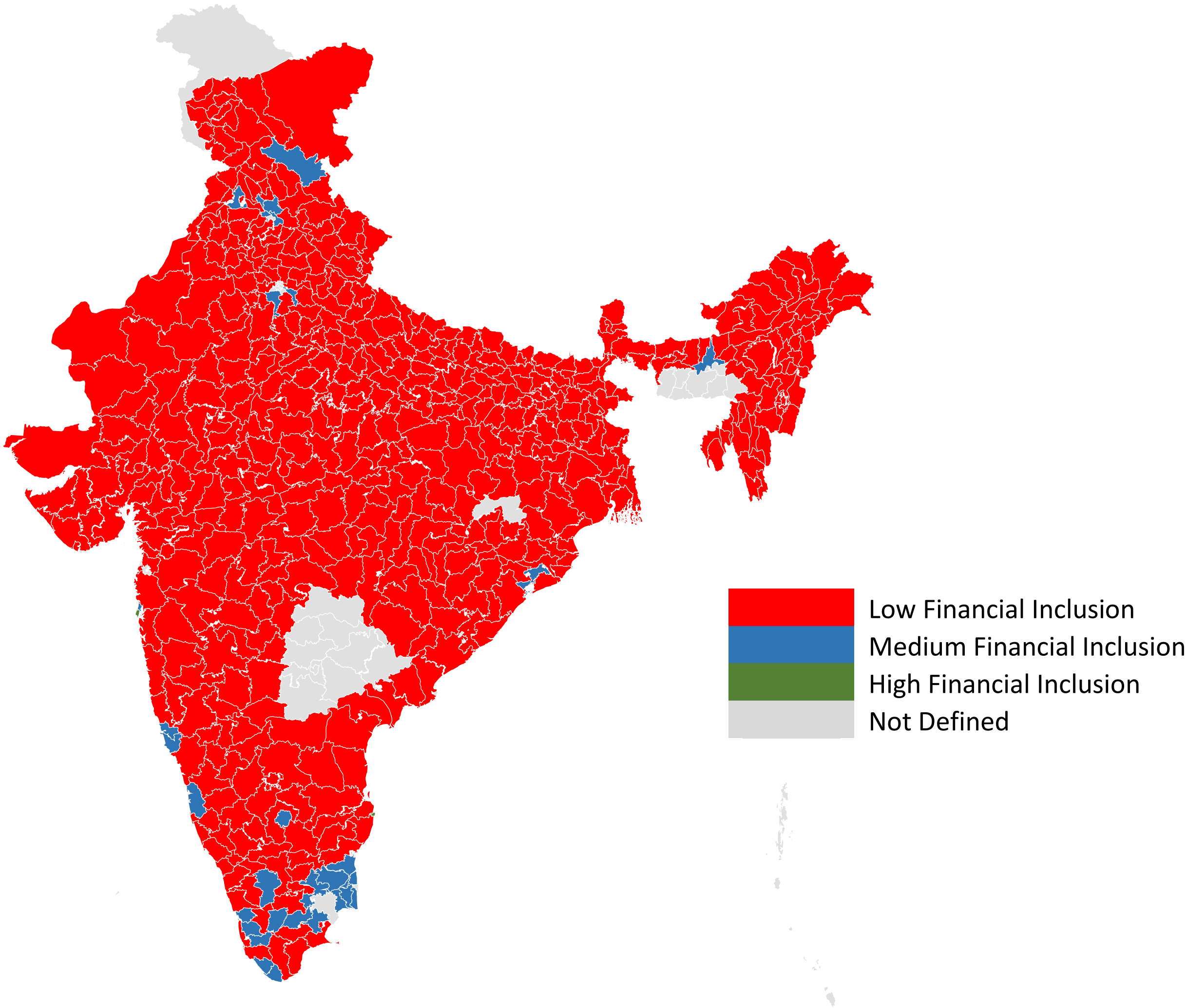
Source: Author's Calculation

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



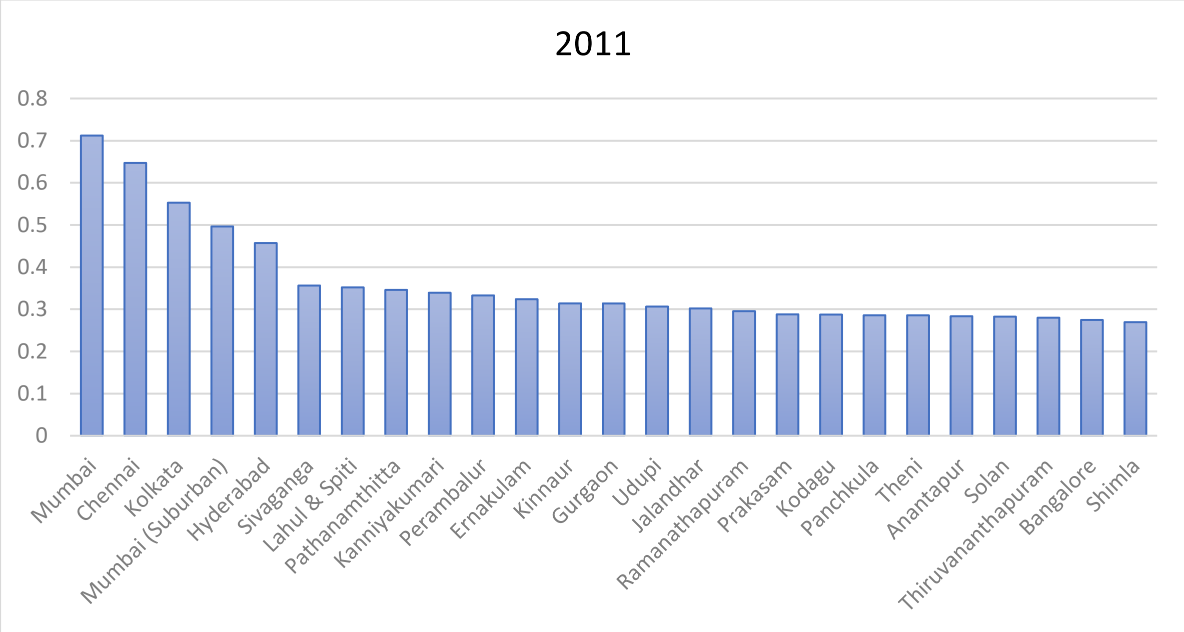
Source: Author's Calculation

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



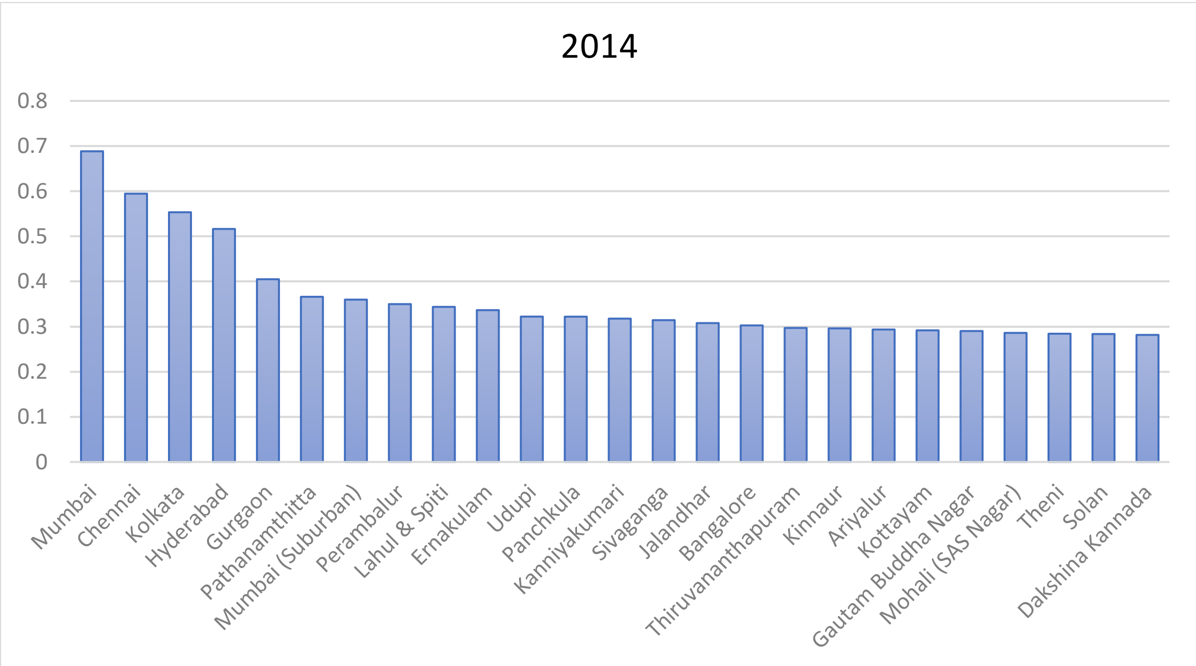
Source: Author's Calculation

Figure 9: Top 25 Districts in 2011.



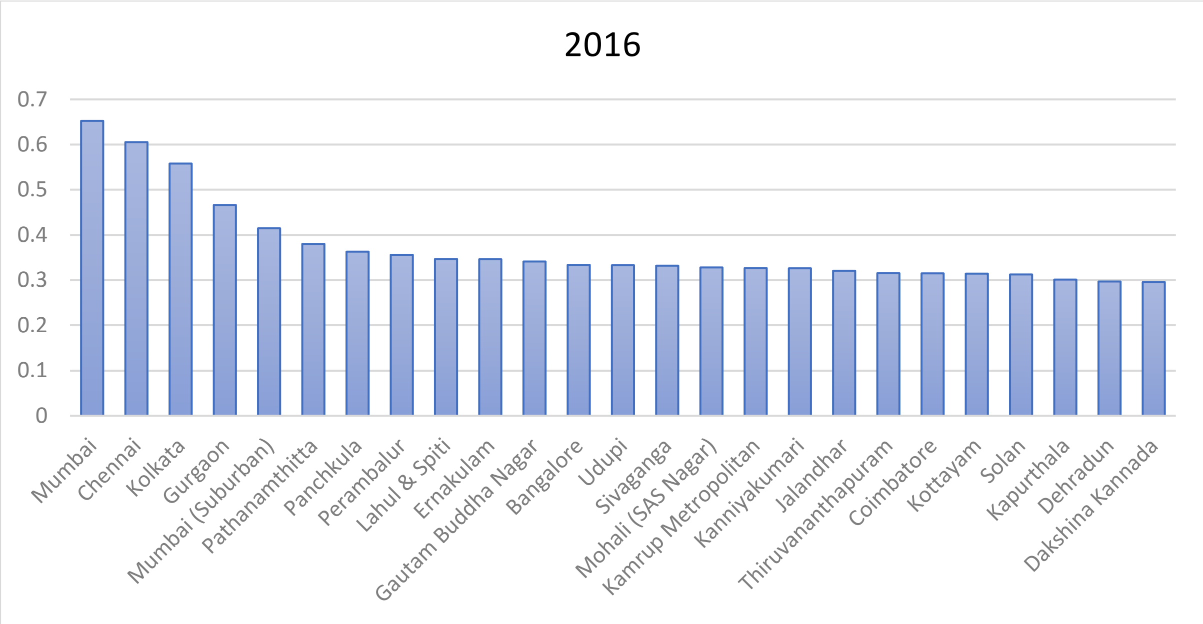
Source: Author's analysis

Figure 10: Top 25 Districts in 2014.



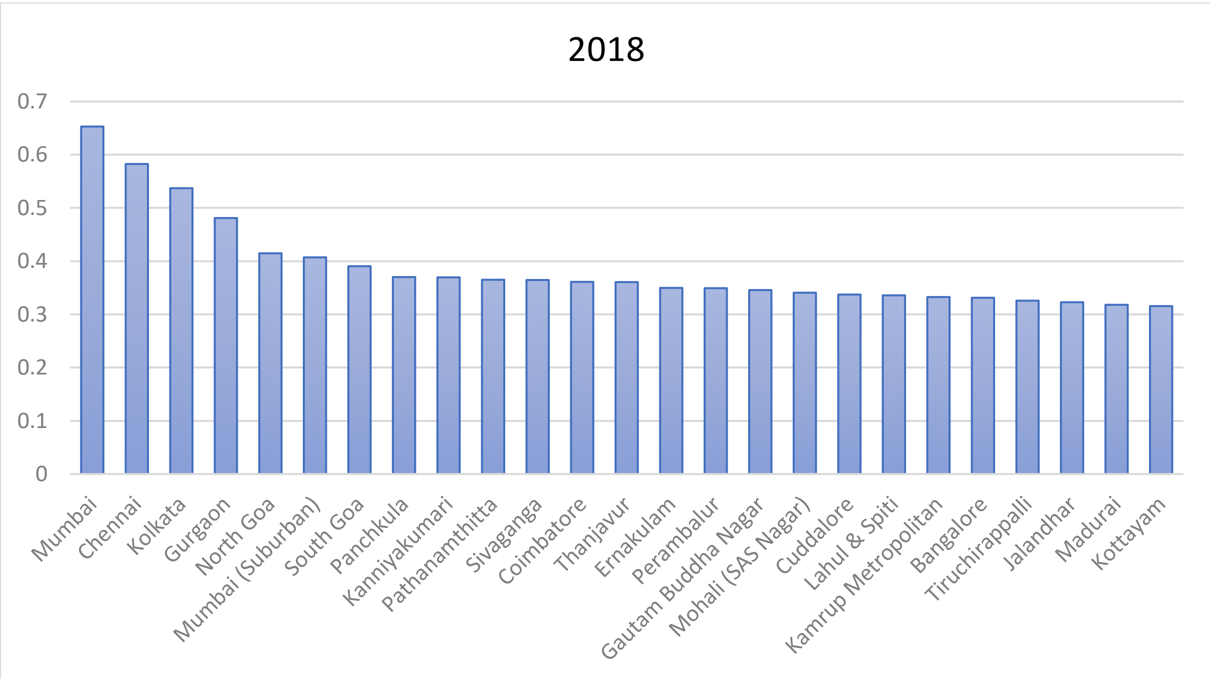
Source: Author's analysis

Figure 11: Top 25 Districts in 2016.



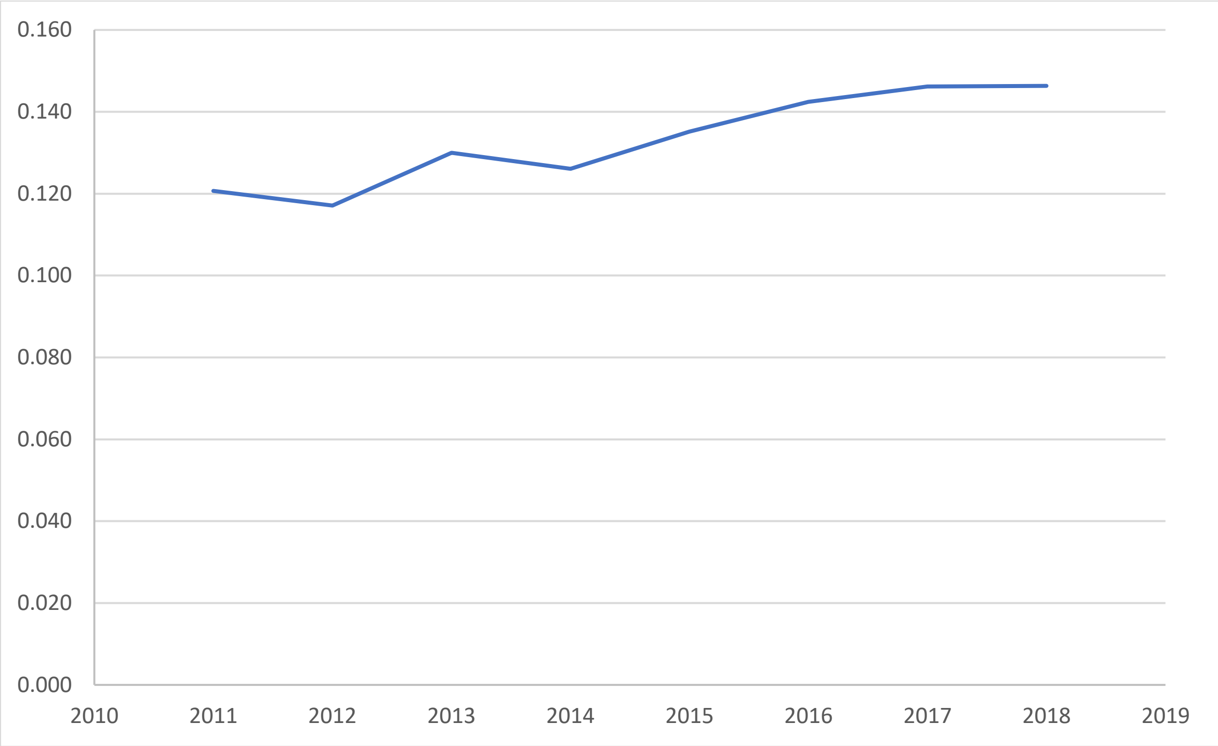
Source: Author's analysis

Figure 12: Top 25 Districts in 2018.



Source: Author's analysis

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



Source: Author's analysis

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

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

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.

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.