Nexus of Financial Inclusion and Economic Growth: Benchmarking the Performance of Indian States

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Nexus of Financial Inclusion and Economic Growth: Benchmarking the Performance of Indian States

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Abstract

The study evaluates and benchmarks the performance of Indian states considering the proposed multidimensional financial inclusion index (FII) as input and economic growth as an output variable. The HDI methodology of UNDP is adopted in the construction of supply and demand side FII for 27 Indian states for the period 2004 to 2017. The output-oriented DEA models are used in which supply and demand FIIs are used as an input and real gross state domestic product as an output to measure the technical efficiency of the states. The major findings of the study suggest Maharashtra performs at the frontier and benchmarks for all other states in both CRS and VRS DEA models which is consistent with FII indices of the states. Therefore, structural reforms are warranted in the policy framework to improve financial services in poor and low performing states to spur economic development.

Key Words: Financial inclusion; Multidimensional Index; Data Envelopment Analysis, Benchmarking, Economic Growth

JEL Classifications: C43, G28, O47

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1. Introduction

There is a substantial increase in the literature and financial services across the globe. The role of finance augmented through financial services was first discussed by Schumpeter (1911). There are three broad perspectives on the role of finance augmented through financial inclusion on economic growth. First, financial services promote economic growth (McKinnon 1973, Shaw 1973, Goldsmith 1969, King and Levine 1993 a,b,c), second real sector development itself creates space and demand for financial development (Robinson 1958, Singh and Mishra 2014, 2015) and finally, there is no role of financial services in the success and failure of nations (Lucas 1988). Irrespective of the differences in views among the economist, there is a general consensus that finance work as a facilitator in the economic system and financial services reduces transaction and information cost in the economy.

From banking to derivatives, there is a sizeable increase in financial products and services all over the world including India. In the middle age debt was considered as a matter of shame and misery. Now the perception of people has changed and finance is used as a leverage to support investment plans by individual, corporations and nations. In India, there are many commercial banks which are operating in the country and Indian subcontinent from more that century but there were millions of people till 2014 which do not have a bank account. 'Financial inclusion' is the buzzword of the current era which ensure access to appropriate financial products and services needed by all sections of the society in a fair manner and at affordable cost which is regulated by mainstream institutional players in the economy. It plays a vital role in the financial development of any country. On August 15, 2014 with a motive to augment financial inclusion, the Government of India launched Pradhaan Mantri Jan Dhan Yojna (PMJDY). Even after providing banking facilities to all by PMJDY scheme there is also a substantial increase in the dormant accounts. There is a need to identify states with poor and low financial inclusion

to benchmark their performances to implement a more comprehensive policy to benefit poorest among the poor.

In view of above the major objective of the study is threefold. First to construct a multidimensional financial inclusion index for Indian states. Second benchmarks the economic performance of the Indian states utilizing the Data Envelopment Analysis (DEA) technique and finally to suggest policy options.

The paper is organised as follows: Section 2 gives an account of a survey of the literature. The theoretical framework is discussed in section 3. Section 4 covers data and methodology. Results and discussion are reported in 5. The study concludes with section 6.

2. Survey of Literature

In the current study, the survey of the literature is divided in to two parts. The first part covers the literature on the construction of financial inclusion index at national, subnational and international level. Similarly, the account of studies conducted on the impact of financial inclusion on economic performance at national, subnational and international level is reported in the second part.

2.1 Financial Inclusion Measurement

There is a large number of studies conducted on the construction of FII on the Indian market and across the globe. The studies majorly differ in parameters and time period used for the construction and assessment of financial inclusion index in the different regions.

Sarma (2008) conducted a notable study on the Indian market and developed a comprehensive multidimensional financial inclusion index utilizing UNDP methodology. Chakravarty and Pal (2010) **also** developed a set of matrices for measuring financial inclusion in the Indian market. Kainth (2011) developed a financial inclusion index for Punjab covering all the districts

utilizing UNDP methodology. Chattopadhyay (2011) developed a financial inclusion index for India followed by a survey in the selected districts of West Bengal. Bagli and Dutta (2012) developed a comprehensive FII for Indian states using principal component analysis utilizing 10 indicators. The studies conducted in the Indian market which applies UNDP and Sarma (2008) methodologies are Gupta et al. (2014), Laha and Kuri (2014), Ambarkhane et al. (2016) Poonam and Chaudhry (2016), Goel and Sharma (2017) and Sethy and Goyari (2018). Further, CRISIL (2018) developed FII for all India, states and districts using four indicators of financial inclusion, namely, bank branch penetration, credit penetration, deposit penetration and insurance penetration.

On the other hand there are a large number of studies conducted on the international market on the construction of FII on a country as well as at the cross-country level. The studies which used the Global Findex database by World Bank for construction of FII are Amidzic, Masssara, and Mialou (2014) and Demirguc-Kunt and Klapper (2012).

The most notable cross-country study was conducted by Honohan (2005). Yorulmaz (2013) also constructed a regional FII for turkey using UNDP methodology. Similar, Pineyro (2013) developed a multi - dimensional FII for municipalities in the states of Mexico using principal component analysis and Camara and David (2014) developed a comprehensive FII using principal component analysis with three indicators, namely, usage, barriers and access for 82 developed and less developed countries. Further, Nwidobie (2019) developed a financial inclusion index for Nigeria using principal component analysis with 8 indicators.

2.2 Financial Inclusion and Economic Performance

Similarly, there is a large number of studies conducted to examine the impact of financial inclusion on the economic performance in India and the international market. All the studies majorly differ in variables, time period, region and econometric methods used in the analysis.

Swamy (2010) conducted one of the important studies on the Indian market to examine the impact of financial inclusion on economic growth in India for the period 1975 to 2007. The study utilized multiple linear regression and the major finding of the study was that financial inclusion has a positive impact on economic growth. Similarly, Ghosh (2011) also examined the impact of financial inclusion on economic growth on 14 major Indian states for the period 1973 to 2004. The study utilized panel regression techniques and the major finding of the study suggest there is a positive impact of financial outreach on economic growth in Indian states. Later, Sharma (2016) conducted a study to examine the nexus of financial inclusion and economic growth in India for the period 20004 to 2013. The major finding of the study suggests that there exist a positive relationship between the various dimensions of financial inclusion and economic growth.

In line with Sharma (2016) and Lenka and Sharma (2017) also examined the impact of financial inclusion on economic growth in India for the period 1980 to 2014. The study utilised principal component analysis to construct financial inclusion index and used autoregressive distributed lag and error correction model for the analysis. The empirical findings of the study suggest that financial inclusion has a positive impact on economic growth in India both in the short run and long run. Further, Iqbal and Sami (2017) analysed the impact of financial inclusion on the economic growth in India for the period 2007-08 to 2013-14 utilizing multiple regression analysis techniques. The major finding of the study shows that result shows that the financial inclusion variables have a positive and significant impact on GDP. Similarly, Sethi and Sethy (2018) examined the relationship between financial inclusion and economic growth in India. The study constructed a multi-dimensional financial inclusion index using UNDP methodology and applied the autoregressive distributed lag (ARDL) approach to cointegration and nonlinear ARDL approach for the analysis. The results of the study show that there exists a long-run relationship between financial inclusion and economic growth.

On the other hand there is a large number of cross-country and country specific studies are conducted in the international market. Sarma and Pais (2011) conducted a cross-country study in 49 countries. The study constructed financial inclusion index using Sarma (2008) methodology. The major finding of the study shows that among the socio-economic variables the income, inequality, adult literacy and urbanisation are important and among the infrastructure variable physical infrastructure for connectivity and information are important. Similarly, Kodan and Chhikara (2013) using log-linear regression technique analysed the impact of financial inclusion on economic development in India and other countries.

Micheal and Sharon (2014) examined the relationship between the financial system, financial inclusion and economic growth in Nigeria for the period 1992 to 2007 using correlation and regression techniques. The result shows that financial inclusion and economic growth are positively related and there should be more focus given to the rural financial institution. Similarly, a large number of studies conducted on Nigerian market to examine the impact of financial inclusion on economic growth (Nwanne 2015, Nkwede 2015, Okoye et al. 2016, Adeola and Evans 2017, Nwafor and Yomi 2018). All the studies concluded there exist a positive relationship between financial inclusion and economic performance.

Unnikrishnan and Jagannathan (2015) also analysed global financial inclusion and its relationship with Gross Domestic product (GDP). Saab (2017) examined the relationship between financial inclusion and economic growth in the countries of the MENA region utilizing VAR technique. The result shows that there is a positive impact of financial inclusion on economic growth. Williams et al. (2017) analysed the role of financial inclusion on poverty reduction and other economic outcomes in developing countries. The result shows that there is a positive impact of banking services on poverty reduction. Kim et al. (2017) also analysed the impact of financial inclusion on economic growth and development in 55 Organization of Islamic Cooperation (OIC) countries for the year 2013. The result shows a positive effect of

financial inclusion on economic growth. Later, Sethi and Acharya (2018) analysed the impact of financial inclusion on the economic growth in 31 developed and developing countries. Similarly, Gourene and Mendy (2018) also analysed the relationship between financial inclusion and economic growth in the West African Economic and Monetary Union (WAEMU) and concluded the same results. Further, Bigirimana and Hongyi (2018) analysed the relationship between the financial inclusion and economic growth of Rwanda for the period 2004 to 2016 using autoregressive distributed lag (ARDL) techniques. The result shows there is a long run relationship between them and financial inclusion causes economic growth in Rwanda.

In view of the above, it can be concluded that most of the studies are conducted at cross-country national and subnational levels. Most of the subnational studies in the Indian market are conducted using small sample and conventional econometric tools. There is a lack of study which constructs a more comprehensive FII index for the larger time period and benchmarks the economic performance at the subnational level. The current study fills this gap by constructing multi-dimensional demand and supply financial inclusion index for 27 major Indian states for the period 2004 to 2017 and benchmarks the economic performance of the Indian states utilizing Data Envelopment Analysis (DEA) technique.

3. Theoretical Framework

The role of financial services in determining the better economic outcome is explained by Schumpeter (1911) in his theory of economic development. Figure 1 is a diagrammatic representation of Schumpeter's model of economic development. The model assumes a perfectly competitive equilibrium in a stationary state. In such economies there is no existence of economic profits, savings, investment, interest and involuntary unemployment. The

equilibrium is characterized by the term “circular flow” in which the same goods are produced in the economy.

According to the theory, there is a circular follow of income in the economy and the same amount of output is produced and repeated period by period. There is no leakages and injections in the economy. Hence, there is static and there is no value addition to the economy. Hence, in order to take the economy from lower level of equilibrium to a higher level of equilibrium there is need to bring dynamism in the system. An entrepreneur is the economic agents with the support of banking services brings new combinations (technology), spur economic growth, brings dynamism in the system and take the economy from lower level of equilibrium to higher level of equilibrium. The whole process in Schumpeter (1911) is referred to as creative destruction.

Figure 1 explains in the Schumpeter (1911) theory there are two types producers in the production process which are capitalist and entrepreneur. Capitalist adopts the conventional mode of production and entrepreneur with the help of banking services introduces new technology in the system which is the engine of growth in the model. It breaks the lower circular flow in the system and higher equilibrium is achieved.

[Figure 1 near here]

In the economic analysis there is a significant role of finance and financial inclusion contributing to economic growth. There are two theoretical channels by which financial inclusion is linked to the economic performance of the economies. Figure 2 establishes theoretical links to both financial inclusions with economic performance. Bothe the channels, affordable credit and attractive deposit give firms and households greater access to various banking services. Further, it reduces transaction and information cost in the economy and spurs economic growth.

[Figure 2 near here]

4. Data and Methodology

4.1 Data

The study uses five supply and three demand side indicators of financial inclusion for the period 2004 to 2017. Two separate demand and supply side financial inclusion index is created for 27 Indian states. The supply side financial inclusion variables used in the study are number of bank accounts with commercial bank per 1000 adults, number of commercial bank branches per 100000 adults, number of commercial bank branches per 1,000 sq. km, number of bank employees per customer and the volume of credit and deposit as the proportion of the state's Net State Domestic Product which are measures of penetration, availability and usage of the banking system respectively. On the other hand, the demand side financial inclusion index used in the study are The proportion of households having access to a savings account, Number of small borrower account per 1000 adults and The proportion of household having access to credit which are measures of access to saving, bank risk and access to credit. Further, real State Gross Domestic Product is taken as a measure of economic performance. All the data are collected from the publication of Economics and Politics Weekly Research Foundation (EPWRF).

4.2 Methodology

The methodology is divided in to two parts. The first parts give information regarding the method adopted in the construction of financial inclusion index. Latter part deals with DEA, the benchmarking method adopted to examine the performance of the Indian states.

4.2.1 Financial Inclusion Index

The Human Development Index (HDI) methodology developed by the United Nation Development Programme (UNDP) is adopted in the construction of current FII. Sarma (2008) also adopted this methodology in the construction of FII. The FII index is calculated with the help of the following formulas:

Formula 1:

$$\boldsymbol{d_i = W_i^*[(A_i - m_i)/(M_i - m_i)} \quad \textbf{(1)}$$

Where,

$\boldsymbol{W_i^*}$ = weight attached to the dimension i, $0 \leq w_i \leq 1$;

$\boldsymbol{A_i}$ = actual value of dimension i;

$\boldsymbol{m_i}$ = minimum value of dimension i;

$\boldsymbol{M_i}$ = maximum value of dimension i;

$\boldsymbol{d_i}$ = dimensions of financial inclusion i.

The formula (1) asserts that weight attached to each dimension will lie between 0 and 1 i.e. $0 \leq w_i \leq 1$ and here, n dimensions of financial inclusion are represented by a point X = (1, 2, 3…). Point W = (1, 2, 3 …) thus shows an ideal situation and Point 0 = (0, 0, 0…0) similarly represents the worst situation. To calculate financial inclusion for Indian states both the points i.e. the ideal point W as well as worst point 0 have an important factor as they indicate the status of financial inclusion. Higher the distance between X and 0, higher will be the financial inclusion and lower the distance between X and 0, lower will be the financial inclusion.

Formula 2:

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

The formula (2), for financial inclusion index (FII), states that X_1 represents the average of the Euclidian distance between X and 0. The higher value of X_1 indicates higher financial inclusion while the lower value of X_1 indicates lower financial inclusion.

Formula 3:

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

The formula (3), for financial inclusion index (FII), states that X_2 represents the inverse Euclidian distance between X and W. Higher value of X_2 indicates higher financial inclusion while the lower value of X_2 indicates lower financial inclusion.

Formula 4:

$$\boldsymbol{FII = (X_1 + X_2)/2} \quad \textbf{(4)}$$

The formula (4) is the simply the average of X_1 and X_2.

FII is constructed by giving equal weights to each dimension of demand side and supply side indicators respectively. Based on the Sarma (2008), Sethy and Goyari (2018) the following value of FII is selected to categorise states:

1. 0 ≤ FII < 0.3 indicates **low financial inclusion;**

2. 0.3 ≤ FII < 0.5 indicates **medium financial inclusion;**

3. 0.5 ≤ FII ≤ 1 indicates **high financial inclusion.**

If the values of FII lie between $0 \leq FII < 0.3$ then the state represents low financial inclusion. On the other hand, if the value lies between $0.3 \leq FII < 0.5$**,** indicates medium financial inclusion. Further, if the value lies between $0.5 < FII \leq 1$ then the state represents high financial inclusion.

4.2 Data Envelopment Analysis

Benchmarking is a widely accepted and most popular tool for performance evaluation of Decision Making Units (DMUs). The business world considers benchmarking as a managerial tool that improves performance by identifying the best performing DMUs which are in practice. These DMUs can be firms, industries, governments, organisations, etc. (Yadava and Neog 2019). There are mainly two approaches dominated the benchmarking method of performance measurement, the widely used methods are- Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA). We have used the DEA method for benchmarking because it is more flexible for piecewise linearity of production frontiers and also it is free from the prior assumptions of production technologies.

DEA is a Linear Programming (LP) based method for benchmarking of DMUs performance. DEA method evaluates the relative efficiency of the performing DMUs and estimates the frontier of best practice. The idea of efficiency measurement came after the pioneering work of Farrell (1957). Further, based on Farrell's efficiency measurement, Charnes, Cooper, and Rhodes (1978) developed the DEA method which is known as the CCR model for relative efficiency measurement. This CCR DEA model works at Constant Returns to Scale (CRS). Later in the time being, Banker, Charnes, and Cooper (1984) developed a DEA model for Variable Returns to Scale (VRS) which is known as the BCC DEA model. The DEA models have mainly two orientations: Input and output-oriented DEA models. The input-oriented model minimises the inputs for a given output level, and the output-oriented model maximises the output level with given inputs of the production. This study follows the output-oriented DEA model for benchmarking of the performance of Indian states' by taking financial inclusion as input and National State Domestic Product (NSDP) as an output variable, here states are considered as DMUs.

Let, j number of DMUs are in practice, for each DMU j = (1,2,3,….., N) and these DUMs using m inputs x_{ij} = (i=1,2,3,…,m) and producing s outputs y_{ij}=(i= i=1,2,3,…,s). Now, suppose k is one of the observed DMU and we wish to calculate Technical Efficiency (TE) of this DMU. Then the output-oriented oriented DEA LP programme is as follows:

φ* = max φ

Subject to

$$\sum_{i=1}^{N} \lambda_j \, x_{ij} \leq x_{ik} \; (i = 1,2, \dots, m)$$

$$\sum_{i=1}^{N} \lambda_j \, y_{ij} \geq \varphi y_{rk} \; (r = 1,2, \dots, s)$$

$$\sum_{i=1}^{N} \lambda_j = 1; \lambda_j \geq 0 (j = 1,2, \dots, N); \; \varphi \text{ is unrestricted.}$$

The value of TE of the DMU k would be measured by τk = 1/ φ*, where φ* is the optimum solution of above DEA LP problem and value of τk varies from 0 to 1. If the value of τk equals to 1 for any DMU, that DMU will be considered as full efficient (working at the frontier) in practice and working as a benchmark for other DMUs. If the value of τk varies between 0 and 1 for any DMU, that DMU will be considered inefficient in the practice.

Further, the study considers the financial inclusion index of Indian states' as an input variable and NSDP as the output variable. Hence, we wish to get maximum NSDP from having a sufficient level of financial inclusion, hence we carried out output-oriented DEA models which means that with the given financial inclusion level we tried to maximize the NSDP. Since, the

minimum value of the financial inclusion index shows the low performance of states, therefore if we run an output-oriented DEA model with this low level of input utilisation that will be problematic. Therefore, we followed the work of Sarkis (2002) for fitting the values of the input variable (financial inclusion) for DEA analysis. We subtracted each index value of financial inclusion from a positive constant value +2 and then applied the DEA models.

5. Results and Discussion

5.1 Financial Inclusion index for Indian states

Table 1 and 2 reports the results of supply and demand side financial inclusion index constructed for 27 Indian states for the period 2004 to 2017. Goa is found to be the most financially included state in the whole study period using supply or demand side financial inclusion index.

From Table 1 the migration in the FII ranks of states from low to high vis-a-vis can be analysed using supply side FII for the period 2004 to 2017. Empirical results show Punjab, Kerala and Maharashtra improved its rank from medium to high financial inclusion state after 2012, 2015 and 2014 respectively. Haryana, Himanchal Pradesh, Jammu and Kashmir, Maharashtra, West Bengal improved its rank from low financial inclusion state to high financial inclusion after 2010, 2015, 2015, 2016 and 2017 respectively whereas Tamil Nadu was under medium FII state for the whole study period. Finally, Rajasthan, Arunachal Pradesh, Assam, Manipur, Nagaland, Chhattisgarh, Madhya Pradesh, Uttar Pradesh, Andhra Pradesh, Gujrat, Bihar, Jharkhand and Odisha were the states under low financial inclusion in the whole study period whereas Mizoram position deteriorated from medium to low FII state from the year 2010 onwards.

[Table 1 near here]

On the other hand, from Table 2 the migration in the FII ranks of states from low to high vis-a-vis can be analysed using demand side FII for the period 2004 to 2017. Goa, Kerala and Tamil Nadu remained as a highly financially included state in the whole study period. Maharashtra improved its rank from medium to highly financially included state 2008 onwards. Jammu and Kashmir, Punjab and Maharashtra improved its rank from medium to high financial inclusion state after 2016, 2016 and 2013 respectively. Andhra Pradesh was under medium FII state in the entire study period whereas Karnataka was also under medium FII state in the entire study period except for the year 2007. In line with supply side FII results, Rajasthan, Arunachal Pradesh, Assam, Manipur, Nagaland, Chhattisgarh, Madhya Pradesh, Uttar Pradesh, Andhra Pradesh, Gujrat, Bihar, Jharkhand and Odisha were also found to be low FII states using demand side FII. The results of both the FII index are is impartially consistent.

[Table 2 near here]

The proposed multidimensional FII for Indian states has a wide range of advantages. First, the FII index is based on a famous method of Euclidean distance which satisfies mathematical properties. Second, it is impartially consistent to those in other previous empirical studies such as Chakravarty and Pal (2010), Kuri and Laha (2011), Chattopadhyay (2011), Gupta et al. (2014), Gupta et al. (2014), Poonam and Chaudhry (2016), Sethy and Goyari (2018) which affirms the validity of the index. Third, the index covers large data of 27 Indian states over the longer periods of time and ranks state according to its values of the FII. Further, it gives a great insight into the financial inclusion enables us to investigate the impact of financial inclusion on economic growth to benchmarks the performance of the Indian states at the subnational level.

In the next step, before benchmarking the performance of DEA the preliminary analysis is done to examine the relationship between the FII and per capita gross state domestic product ranks of the respective states.

Figure 3 reports supply side FII and per capita GSDP ranks of Indian states. The result show FII and per capita GSDP ranks are similar in case of Goa and marginal differences in case of the majority of the states.

[Figure 3 near here]

Similarly, Figure 4 reports demand side FII and per capita GSDP ranks of Indian states. The result show FII and per capita GSDP ranks are quite similar in the case of Goa and marginal differences in case of the majority of the states. From Figure 2 and 4, it can be concluded that there exists a positive relationship between financial inclusion and economic performance.

[Figure 3 near here]

5.2 Benchmarking the Performance of Financial Inclusion of Indian States

Consider the DEA results reported in Table 3, where for the given input (financial inclusion) we tried to find out maximum equi-proportionate incensement in the output (NSDP). Under the CRS assumption, it is clear that in the initial years (2004, 2005 & 2006) the performance of states was high compared to mid-years (2008, 2009 & 2010) and again slightly improved in the last years. State Maharashtra is performing at the frontier which is the benchmark for all other states. It is also visible from Table 4 that, state Maharashtra is again performing at the frontier if scale improved to a large scale (VRS scale). The average efficiency of the demand side CRS DEA model is 0.214 which reveals that there is still a possibility to a proportionate increase in NSDP by 78.6% with the same level of financial inclusion and by 74.8% considering VRS DEA model. The possible improvement in the NSDP level with financial

inclusion shows only partial percentage enhancement because the effect of other variables over NSDP assumed to be constant.

[Table 3 near here]

[Table 4 near here]

Table 5 and 6 show the supply side DEA models under CRS and VRS criterion respectively. The average CRS DEA TE score is similar to the demand side DEA model. Maharashtra is again performing at the frontier under the CRS DEA model, but when the scale size improved (Table 5; VRS DEA model), state Goa become efficient and both states (Maharashtra and Goa) are started performing at the frontier and become best in practice compared to other states. The average efficiency under supply-side models is; 0.211 and 0.270. These supply-side TE scores reveal that there is the possibility to increase the NSDP level by 78.9% (under the CRS criterion) and 73% (under the VRS criterion) with the same level of financial inclusion in the states (again these incensements in NSDP are partial effects).

[Table 5 near here]

[Table 6 near here]

6. Conclusion

The current study proposed a multi-dimensional demand and supply side financial inclusion index for 27 major Indian states similar to UNDP for 2004 to 2017. The study also benchmarks the economic performance of the Indian states utilizing the Data Envelopment Analysis (DEA) technique. The proposed FIIs can be used assess financial inclusion across different Indian states and to monitor the progress of different states as well as the country as a whole with respect to change in FIIs over the period and across the states. The FIIs indices are calculated for 27 Indian states for the years 2004 to 2017 indicate that states across India are at various

levels of financial inclusion. Nevertheless, FII measure tends to indicate marginal improvement in the level of financial across states during 2004-2017. Goa is found to be a high financially included state from both demand and supply side FII. There is a significant improvement in the ranks of states from low FII to medium and high.

The DEA results show Maharashtra is performing at the frontier which is the benchmark for all other states, and state Goa emerged as the best performer along with Maharashtra in supply side VRS DEA model which concludes that scale size improvement can further increase the efficiency levels. The scale size improvement results (VRS DEA models) are consistent with financial inclusion increases; more financial inclusion gives better performance results (improvement in technical efficiency) for the Indian states.

Hence, structural reforms are warranted in the policy framework to provide condition as well as financial services to poorest among poor at low or no cost for better economic outcomes.

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Table 1: Supply Side Financial Inclusion Index of Indian States

State/Years	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Andhra Pradesh	0.21	0.207	0.204	0.193	0.193	0.21	0.221	0.222	0.223	0.222	0.242	0.244	0.271	0.282
Arunachal Pradesh	0.161	0.151	0.139	0.143	0.174	0.179	0.141	0.161	0.127	0.168	0.205	0.183	0.168	0.173
Assam	0.129	0.135	0.13	0.145	0.156	0.143	0.137	0.132	0.106	0.1	0.118	0.105	0.116	0.134
Bihar	0.202	0.193	0.192	0.186	0.176	0.162	0.175	0.161	0.144	0.136	0.153	0.157	0.166	0.18
Chhattisgarh	0.117	0.111	0.125	0.132	0.127	0.129	0.115	0.102	0.092	0.096	0.122	0.103	0.13	0.136
Goa	0.726	0.705	0.72	0.732	0.74	0.734	0.759	0.768	0.721	0.743	0.821	0.829	0.807	0.81
Gujarat	0.232	0.24	0.232	0.248	0.257	0.247	0.268	0.27	0.224	0.214	0.265	0.282	0.273	0.295
Haryana	0.239	0.244	0.27	0.292	0.299	0.293	0.315	0.324	0.339	0.336	0.394	0.449	0.433	0.448
Himanchal Pradesh	0.268	0.26	0.264	0.285	0.277	0.277	0.293	0.287	0.265	0.261	0.286	0.332	0.332	0.339
Jammu & Kashmir	0.233	0.227	0.223	0.241	0.249	0.229	0.217	0.211	0.197	0.209	0.296	0.357	0.382	0.394
Jharkhand	0.18	0.152	0.154	0.166	0.165	0.174	0.174	0.173	0.148	0.137	0.165	0.164	0.183	0.192
Karnataka	0.348	0.335	0.334	0.335	0.345	0.343	0.344	0.349	0.301	0.293	0.327	0.35	0.38	0.371
Kerala	0.481	0.459	0.461	0.465	0.472	0.476	0.489	0.512	0.46	0.447	0.472	0.497	0.509	0.521
Madhya Pradesh	0.169	0.173	0.188	0.198	0.193	0.191	0.184	0.182	0.146	0.126	0.137	0.139	0.144	0.147
Maharashtra	0.41	0.437	0.476	0.48	0.417	0.412	0.456	0.501	0.442	0.438	0.499	0.521	0.499	0.5
Manipur	0.199	0.173	0.207	0.164	0.195	0.148	0.065	0.062	0.052	0.046	0.074	0.021	0.058	0.054
Meghalaya	0.251	0.265	0.3	0.339	0.325	0.332	0.336	0.331	0.242	0.247	0.287	0.304	0.275	0.272
Mizoram	0.33	0.329	0.328	0.328	0.332	0.311	0.288	0.294	0.2	0.192	0.259	0.262	0.241	0.224
Nagaland	0.18	0.194	0.187	0.199	0.241	0.222	0.21	0.217	0.177	0.195	0.293	0.264	0.214	0.203
Odisha	0.166	0.169	0.166	0.174	0.183	0.17	0.177	0.24	0.186	0.18	0.177	0.18	0.204	0.204
Punjab	0.395	0.396	0.402	0.429	0.407	0.413	0.435	0.444	0.546	0.546	0.497	0.552	0.527	0.54
Rajasthan	0.135	0.139	0.139	0.159	0.16	0.143	0.164	0.155	0.132	0.112	0.177	0.194	0.167	0.177
Sikkim	0.293	0.294	0.248	0.303	0.38	0.325	0.312	0.335	0.253	0.24	0.339	0.362	0.326	0.311
Tamil Nadu	0.332	0.317	0.314	0.313	0.331	0.336	0.324	0.321	0.311	0.301	0.32	0.33	0.353	0.372
Uttar Pradesh	0.198	0.19	0.18	0.176	0.171	0.17	0.173	0.17	0.177	0.171	0.179	0.188	0.204	0.22
Uttarakhand	0.302	0.285	0.286	0.295	0.313	0.306	0.301	0.293	0.26	0.249	0.303	0.342	0.324	0.335
West Bengal	0.305	0.321	0.326	0.349	0.358	0.324	0.33	0.333	0.397	0.373	0.29	0.294	0.291	0.308
All India	0.266	0.263	0.266	0.277	0.283	0.274	0.274	0.280	0.254	0.251	0.285	0.296	0.295	0.302

Source: Author's calculation

Table 2: Demand Side Financial Inclusion Index of Indian States

State/Years	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Andhra Pradesh	0.399	0.449	0.404	0.423	0.420	0.405	0.454	0.531	0.480	0.467	0.482	0.483	0.466	0.453
Arunachal Pradesh	0.078	0.063	0.062	0.060	0.083	0.088	0.085	0.097	0.097	0.074	0.073	0.082	0.093	0.101
Assam	0.086	0.077	0.071	0.067	0.079	0.083	0.091	0.112	0.116	0.102	0.113	0.130	0.226	0.263
Bihar	0.090	0.083	0.055	0.051	0.051	0.069	0.061	0.081	0.082	0.063	0.069	0.081	0.142	0.163
Chhattisgarh	0.071	0.059	0.045	0.040	0.045	0.049	0.048	0.052	0.056	0.039	0.055	0.091	0.135	0.156
Goa	0.592	0.616	0.629	0.595	0.606	0.551	0.615	0.654	0.615	0.590	0.582	0.591	0.590	0.546
Gujarat	0.179	0.171	0.169	0.163	0.168	0.159	0.160	0.166	0.163	0.143	0.156	0.169	0.192	0.199
Haryana	0.270	0.260	0.259	0.242	0.246	0.259	0.279	0.305	0.266	0.241	0.260	0.281	0.327	0.331
Himanchal Pradesh	0.285	0.270	0.240	0.226	0.222	0.250	0.224	0.300	0.253	0.222	0.219	0.223	0.233	0.232
Jammu & Kashmir	0.210	0.196	0.198	0.198	0.226	0.195	0.208	0.184	0.202	0.237	0.230	0.275	0.308	0.324
Jharkhand	0.138	0.134	0.121	0.102	0.114	0.098	0.098	0.117	0.122	0.118	0.130	0.139	0.189	0.204
Karnataka	0.494	0.552	0.499	0.504	0.446	0.446	0.460	0.496	0.416	0.354	0.363	0.393	0.412	0.401
Kerala	0.587	0.619	0.658	0.529	0.525	0.490	0.504	0.624	0.577	0.570	0.587	0.606	0.556	0.530
Madhya Pradesh	0.128	0.135	0.111	0.080	0.094	0.101	0.113	0.095	0.109	0.094	0.122	0.144	0.191	0.199
Maharashtra	0.291	0.361	0.290	0.457	0.696	0.690	0.638	0.663	0.612	0.403	0.390	0.391	0.448	0.486
Manipur	0.011	0.009	0.005	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.017	0.041	0.054	0.077
Meghalaya	0.117	0.108	0.121	0.108	0.103	0.078	0.079	0.093	0.101	0.079	0.087	0.091	0.114	0.117
Mizoram	0.110	0.096	0.065	0.068	0.104	0.103	0.121	0.126	0.148	0.123	0.162	0.176	0.218	0.233
Nagaland	0.006	0.000	0.006	0.021	0.043	0.048	0.038	0.071	0.074	0.056	0.042	0.037	0.037	0.038
Odisha	0.223	0.217	0.191	0.181	0.181	0.161	0.167	0.234	0.198	0.176	0.161	0.170	0.195	0.203
Punjab	0.381	0.370	0.341	0.344	0.324	0.322	0.298	0.327	0.298	0.280	0.278	0.295	0.336	0.340
Rajasthan	0.170	0.171	0.148	0.144	0.151	0.149	0.142	0.147	0.141	0.122	0.125	0.142	0.197	0.196
Sikkim	0.146	0.152	0.154	0.146	0.142	0.112	0.146	0.151	0.156	0.158	0.164	0.168	0.244	0.252
Tamil Nadu	0.681	0.678	0.685	0.688	0.594	0.502	0.715	0.691	0.712	0.713	0.736	0.739	0.743	0.739
Uttar Pradesh	0.215	0.213	0.174	0.169	0.175	0.187	0.195	0.201	0.200	0.188	0.192	0.206	0.238	0.243
Uttarakhand	0.282	0.276	0.268	0.251	0.251	0.252	0.261	0.267	0.245	0.226	0.222	0.239	0.284	0.283
West Bengal	0.167	0.149	0.123	0.101	0.097	0.090	0.083	0.096	0.107	0.089	0.094	0.109	0.198	0.221
All India	0.237	0.240	0.226	0.221	0.229	0.220	0.233	0.255	0.242	0.220	0.226	0.240	0.273	0.279

Source: Author's calculation

Table 3: Demand side DEA Constant Returns to Scale (CRS) output-oriented model

States	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average
Andhra Pradesh	0.598	0.572	0.560	0.501	0.425	0.441	0.453	0.469	0.527	0.576	0.582	0.592	0.583	0.567	**0.532**
Arunachal Pradesh	0.006	0.007	0.007	0.006	0.005	0.005	0.005	0.005	0.006	0.007	0.007	0.008	0.007	0.007	**0.006**
Assam	0.128	0.110	0.104	0.086	0.069	0.072	0.075	0.070	0.082	0.091	0.091	0.092	0.101	0.096	**0.090**
Bihar	0.181	0.160	0.143	0.132	0.105	0.119	0.119	0.122	0.140	0.156	0.155	0.152	0.149	0.147	**0.141**
Chhattisgarh	0.104	0.097	0.092	0.086	0.071	0.076	0.075	0.073	0.088	0.100	0.104	0.102	0.099	0.096	**0.090**
Goa	0.031	0.036	0.036	0.031	0.025	0.026	0.028	0.030	0.033	0.030	0.025	0.030	0.031	0.030	**0.030**
Gujarat	0.453	0.439	0.464	0.398	0.337	0.350	0.371	0.361	0.363	0.432	0.442	0.462	0.462	0.453	**0.413**
Haryana	0.238	0.217	0.218	0.191	0.158	0.168	0.181	0.174	0.186	0.214	0.221	0.222	0.223	0.216	**0.202**
Himanchal Pradesh	0.061	0.055	0.054	0.046	0.038	0.041	0.041	0.041	0.045	0.051	0.052	0.052	0.051	0.048	**0.048**
Jammu & Kashmir	0.060	0.060	0.058	0.049	0.040	0.041	0.041	0.038	0.047	0.054	0.053	0.050	0.054	0.051	**0.050**
Jharkhand	0.115	0.126	0.112	0.090	0.083	0.079	0.083	0.086	0.087	0.102	0.098	0.105	0.090	0.090	**0.096**
Karnataka	0.445	0.454	0.446	0.391	0.322	0.338	0.328	0.327	0.415	0.460	0.478	0.486	0.489	0.464	**0.417**
Kerala	0.357	0.341	0.355	0.278	0.229	0.231	0.242	0.249	0.277	0.319	0.316	0.314	0.290	0.272	**0.291**
Madhya Pradesh	0.268	0.239	0.229	0.195	0.156	0.173	0.181	0.168	0.181	0.217	0.216	0.216	0.216	0.216	**0.205**
Maharashtra	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	**1.000**
Manipur	0.011	0.010	0.010	0.008	0.006	0.007	0.007	0.006	0.007	0.008	0.008	0.008	0.008	0.007	**0.008**
Meghalaya	0.014	0.014	0.014	0.012	0.009	0.010	0.010	0.010	0.011	0.012	0.012	0.011	0.010	0.010	**0.011**
Mizoram	0.006	0.006	0.005	0.004	0.004	0.004	0.005	0.005	0.004	0.005	0.005	0.006	0.006	0.006	**0.005**
Nagaland	0.012	0.012	0.012	0.010	0.008	0.009	0.009	0.009	0.007	0.008	0.008	0.008	0.007	0.007	**0.009**
Odisha	0.170	0.172	0.165	0.147	0.124	0.129	0.129	0.128	0.139	0.157	0.160	0.154	0.152	0.149	**0.148**
Punjab	0.281	0.234	0.224	0.197	0.161	0.167	0.166	0.159	0.170	0.192	0.193	0.191	0.185	0.176	**0.193**
Rajasthan	0.334	0.276	0.267	0.237	0.190	0.202	0.205	0.207	0.254	0.285	0.288	0.293	0.289	0.275	**0.257**
Sikkim	0.004	0.004	0.004	0.003	0.003	0.003	0.005	0.005	0.007	0.007	0.007	0.007	0.008	0.007	**0.005**
Tamil Nadu	0.671	0.654	0.689	0.632	0.476	0.461	0.567	0.555	0.632	0.724	0.748	0.739	0.719	0.663	**0.638**
Uttar Pradesh	0.657	0.576	0.552	0.473	0.387	0.408	0.416	0.397	0.436	0.492	0.492	0.485	0.482	0.460	**0.479**
Uttarakhand	0.060	0.057	0.059	0.053	0.048	0.053	0.059	0.058	0.071	0.082	0.084	0.084	0.083	0.078	**0.066**
West Bengal	0.532	0.445	0.429	0.363	0.297	0.304	0.311	0.292	0.298	0.334	0.325	0.317	0.316	0.307	**0.348**
All_states_average	**0.252**	**0.236**	**0.234**	**0.208**	**0.177**	**0.182**	**0.189**	**0.187**	**0.204**	**0.226**	**0.228**	**0.229**	**0.226**	**0.218**	**0.214**

Source: Author's estimation

Table 4: Demand side DEA Variable Returns to Scale (VRS) output-oriented model

States	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average
Andhra Pradesh	0.646	0.623	0.605	0.512	0.516	0.537	0.514	0.515	0.577	0.605	0.617	0.628	0.591	0.579	**0.576**
Arunachal Pradesh	0.007	0.008	0.008	0.007	0.007	0.008	0.008	0.007	0.009	0.008	0.008	0.009	0.009	0.008	**0.008**
Assam	0.143	0.129	0.117	0.108	0.102	0.105	0.105	0.099	0.112	0.109	0.106	0.107	0.115	0.110	**0.112**
Bihar	0.202	0.187	0.162	0.166	0.158	0.176	0.170	0.175	0.193	0.189	0.186	0.181	0.178	0.178	**0.179**
Chhattisgarh	0.117	0.115	0.105	0.110	0.107	0.113	0.107	0.106	0.123	0.122	0.126	0.120	0.119	0.117	**0.115**
Goa	0.040	0.049	0.049	0.039	0.027	0.029	0.029	0.030	0.034	0.035	0.028	0.034	0.035	0.032	**0.035**
Gujarat	0.483	0.489	0.496	0.474	0.473	0.492	0.501	0.495	0.481	0.503	0.506	0.526	0.539	0.539	**0.500**
Haryana	0.241	0.231	0.222	0.218	0.212	0.224	0.229	0.221	0.232	0.236	0.239	0.238	0.241	0.238	**0.230**
Himanchal Pradesh	0.062	0.058	0.055	0.053	0.052	0.054	0.054	0.053	0.057	0.057	0.057	0.058	0.058	0.056	**0.056**
Jammu & Kashmir	0.063	0.066	0.061	0.057	0.055	0.057	0.054	0.052	0.061	0.059	0.059	0.053	0.058	0.056	**0.058**
Jharkhand	0.126	0.144	0.123	0.111	0.120	0.115	0.116	0.121	0.118	0.120	0.114	0.121	0.105	0.106	**0.119**
Karnataka	0.523	0.561	0.521	0.418	0.384	0.401	0.371	0.368	0.473	0.474	0.486	0.486	0.501	0.490	**0.461**
Kerala	0.465	0.467	0.496	0.310	0.259	0.267	0.266	0.256	0.284	0.368	0.363	0.368	0.319	0.286	**0.341**
Madhya Pradesh	0.294	0.272	0.253	0.243	0.229	0.251	0.251	0.240	0.246	0.259	0.252	0.249	0.252	0.257	**0.253**
Maharashtra	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	**1.000**
Manipur	0.012	0.012	0.012	0.010	0.010	0.010	0.010	0.009	0.010	0.010	0.010	0.010	0.010	0.009	**0.010**
Meghalaya	0.015	0.016	0.015	0.014	0.013	0.015	0.014	0.014	0.016	0.015	0.014	0.013	0.012	0.012	**0.014**
Mizoram	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.007	0.006	0.006	0.006	0.007	0.007	0.008	**0.006**
Nagaland	0.014	0.014	0.014	0.013	0.013	0.013	0.013	0.012	0.010	0.009	0.010	0.009	0.009	0.008	**0.011**
Odisha	0.177	0.187	0.174	0.173	0.173	0.182	0.174	0.169	0.180	0.179	0.183	0.175	0.176	0.177	**0.177**
Punjab	0.300	0.236	0.232	0.211	0.207	0.214	0.208	0.199	0.208	0.207	0.206	0.202	0.199	0.193	**0.216**
Rajasthan	0.358	0.307	0.289	0.285	0.269	0.286	0.279	0.287	0.340	0.335	0.335	0.338	0.336	0.328	**0.312**
Sikkim	0.004	0.004	0.004	0.004	0.004	0.004	0.007	0.006	0.009	0.008	0.008	0.008	0.009	0.008	**0.006**
Tamil Nadu	1.000	1.000	1.000	1.000	0.513	0.527	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	**0.931**
Uttar Pradesh	0.686	0.628	0.590	0.562	0.542	0.565	0.551	0.534	0.566	0.558	0.553	0.541	0.547	0.533	**0.568**
Uttarakhand	0.061	0.060	0.060	0.060	0.064	0.070	0.076	0.075	0.090	0.091	0.092	0.092	0.092	0.089	**0.077**
West Bengal	0.571	0.502	0.471	0.447	0.433	0.443	0.438	0.416	0.407	0.399	0.385	0.372	0.367	0.360	**0.429**
All_states_average	**0.282**	**0.273**	**0.264**	**0.245**	**0.220**	**0.228**	**0.243**	**0.240**	**0.253**	**0.258**	**0.257**	**0.257**	**0.255**	**0.251**	**0.252**

Source: Author's estimation

Table 5: Supply side DEA Constant Returns to Scale (CRS) output-oriented model

States	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average
Andhra Pradesh	0.497	0.471	0.444	0.431	0.452	0.476	0.446	0.435	0.506	0.486	0.469	0.470	0.500	0.506	**0.471**
Arunachal Pradesh	0.006	0.007	0.006	0.006	0.006	0.007	0.006	0.006	0.007	0.007	0.007	0.008	0.007	0.007	**0.007**
Assam	0.121	0.108	0.096	0.089	0.087	0.090	0.087	0.079	0.092	0.089	0.085	0.084	0.092	0.088	**0.092**
Bihar	0.179	0.162	0.137	0.139	0.137	0.152	0.144	0.143	0.162	0.159	0.151	0.145	0.146	0.147	**0.150**
Chhattisgarh	0.099	0.095	0.085	0.089	0.090	0.096	0.088	0.084	0.101	0.100	0.101	0.094	0.095	0.094	**0.094**
Goa	0.031	0.037	0.035	0.034	0.034	0.036	0.036	0.037	0.040	0.033	0.028	0.033	0.035	0.036	**0.035**
Gujarat	0.434	0.435	0.428	0.411	0.429	0.446	0.447	0.429	0.422	0.440	0.438	0.453	0.468	0.474	**0.440**
Haryana	0.217	0.205	0.196	0.194	0.197	0.208	0.209	0.197	0.218	0.222	0.223	0.227	0.231	0.230	**0.212**
Himanchal Pradesh	0.057	0.052	0.049	0.047	0.048	0.050	0.049	0.046	0.051	0.051	0.050	0.051	0.052	0.051	**0.050**
Jammu & Kashmir	0.056	0.058	0.053	0.049	0.049	0.051	0.047	0.043	0.053	0.052	0.052	0.048	0.054	0.052	**0.051**
Jharkhand	0.110	0.122	0.101	0.092	0.104	0.100	0.098	0.099	0.099	0.101	0.093	0.097	0.087	0.088	**0.099**
Karnataka	0.377	0.377	0.358	0.346	0.367	0.384	0.346	0.334	0.434	0.433	0.436	0.435	0.464	0.451	**0.396**
Kerala	0.309	0.291	0.276	0.262	0.268	0.278	0.272	0.258	0.288	0.287	0.273	0.268	0.272	0.268	**0.276**
Madhya Pradesh	0.255	0.233	0.212	0.205	0.200	0.220	0.214	0.198	0.207	0.216	0.203	0.198	0.204	0.208	**0.212**
Maharashtra	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	**1.000**
Manipur	0.011	0.011	0.010	0.009	0.009	0.009	0.008	0.007	0.008	0.008	0.008	0.007	0.008	0.007	**0.008**
Meghalaya	0.014	0.014	0.013	0.013	0.013	0.014	0.013	0.013	0.014	0.013	0.013	0.011	0.011	0.010	**0.013**
Mizoram	0.006	0.006	0.006	0.005	0.005	0.006	0.006	0.006	0.005	0.005	0.005	0.006	0.006	0.006	**0.006**
Nagaland	0.013	0.012	0.011	0.011	0.011	0.012	0.011	0.010	0.008	0.008	0.008	0.008	0.007	0.007	**0.010**
Odisha	0.153	0.160	0.145	0.144	0.151	0.158	0.147	0.144	0.155	0.154	0.151	0.143	0.147	0.148	**0.150**
Punjab	0.264	0.227	0.208	0.204	0.206	0.214	0.205	0.192	0.223	0.222	0.206	0.207	0.203	0.198	**0.213**
Rajasthan	0.305	0.258	0.237	0.235	0.231	0.245	0.235	0.233	0.283	0.277	0.276	0.277	0.275	0.270	**0.260**
Sikkim	0.004	0.004	0.004	0.003	0.004	0.004	0.006	0.006	0.008	0.007	0.008	0.008	0.008	0.007	**0.006**
Tamil Nadu	0.494	0.490	0.479	0.485	0.487	0.503	0.493	0.485	0.541	0.536	0.524	0.513	0.531	0.509	**0.505**
Uttar Pradesh	0.605	0.542	0.494	0.468	0.469	0.490	0.466	0.437	0.483	0.477	0.455	0.441	0.457	0.449	**0.481**
Uttarakhand	0.057	0.054	0.054	0.054	0.060	0.066	0.069	0.066	0.081	0.081	0.082	0.082	0.082	0.080	**0.069**
West Bengal	0.536	0.468	0.429	0.412	0.418	0.420	0.405	0.374	0.395	0.383	0.338	0.323	0.322	0.319	**0.396**
Average_all_states	**0.230**	**0.218**	**0.206**	**0.201**	**0.205**	**0.212**	**0.206**	**0.199**	**0.218**	**0.217**	**0.210**	**0.209**	**0.213**	**0.212**	**0.211**

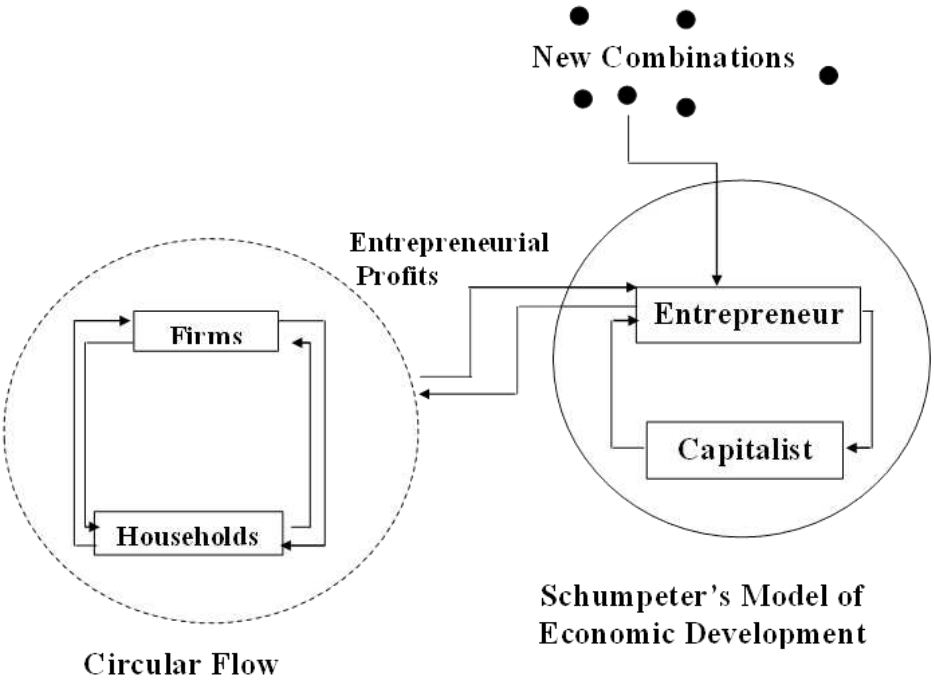
Source: Author's estimation

Table 6: Supply side DEA Variable Returns to Scale (VRS) output-oriented model

States	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average
Andhra Pradesh	0.560	0.541	0.523	0.512	0.516	0.537	0.514	0.515	0.577	0.553	0.549	0.558	0.576	0.579	**0.544**
Arunachal Pradesh	0.007	0.008	0.008	0.007	0.007	0.008	0.008	0.007	0.009	0.008	0.008	0.009	0.009	0.008	**0.008**
Assam	0.143	0.129	0.117	0.108	0.102	0.105	0.105	0.099	0.112	0.109	0.106	0.107	0.115	0.110	**0.112**
Bihar	0.202	0.187	0.162	0.166	0.158	0.176	0.170	0.175	0.193	0.189	0.186	0.181	0.178	0.178	**0.179**
Chhattisgarh	0.117	0.115	0.105	0.110	0.107	0.113	0.107	0.106	0.123	0.122	0.126	0.120	0.119	0.117	**0.115**
Goa	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	**1.000**
Gujarat	0.483	0.489	0.496	0.474	0.473	0.492	0.501	0.495	0.481	0.503	0.506	0.526	0.539	0.539	**0.500**
Haryana	0.241	0.231	0.222	0.218	0.212	0.224	0.229	0.221	0.232	0.236	0.239	0.238	0.241	0.238	**0.230**
Himanchal Pradesh	0.062	0.058	0.055	0.053	0.052	0.054	0.054	0.053	0.057	0.057	0.057	0.058	0.058	0.056	**0.056**
Jammu & Kashmir	0.063	0.066	0.061	0.057	0.055	0.057	0.054	0.052	0.061	0.059	0.059	0.053	0.058	0.056	**0.058**
Jharkhand	0.126	0.144	0.123	0.111	0.120	0.115	0.116	0.121	0.118	0.120	0.114	0.121	0.105	0.106	**0.119**
Karnataka	0.392	0.401	0.391	0.379	0.384	0.401	0.371	0.368	0.473	0.474	0.486	0.485	0.501	0.490	**0.428**
Kerala	0.378	0.312	0.279	0.265	0.311	0.330	0.298	0.266	0.303	0.294	0.277	0.272	0.279	0.282	**0.296**
Madhya Pradesh	0.294	0.272	0.253	0.243	0.229	0.251	0.251	0.240	0.246	0.259	0.252	0.249	0.252	0.257	**0.253**
Maharashtra	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	**1.000**
Manipur	0.012	0.012	0.012	0.010	0.010	0.010	0.010	0.009	0.010	0.010	0.010	0.010	0.010	0.009	**0.010**
Meghalaya	0.015	0.016	0.015	0.014	0.013	0.015	0.014	0.014	0.016	0.015	0.014	0.013	0.012	0.012	**0.014**
Mizoram	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.007	0.006	0.006	0.006	0.007	0.007	0.008	**0.006**
Nagaland	0.014	0.014	0.014	0.013	0.013	0.013	0.013	0.012	0.010	0.009	0.010	0.009	0.009	0.008	**0.011**
Odisha	0.177	0.187	0.174	0.173	0.173	0.182	0.174	0.169	0.180	0.179	0.183	0.175	0.176	0.177	**0.177**
Punjab	0.267	0.233	0.218	0.211	0.207	0.214	0.208	0.199	0.326	0.316	0.206	0.224	0.218	0.221	**0.233**
Rajasthan	0.358	0.307	0.289	0.285	0.269	0.286	0.279	0.287	0.340	0.335	0.335	0.338	0.336	0.328	**0.312**
Sikkim	0.004	0.004	0.004	0.004	0.004	0.004	0.007	0.006	0.009	0.008	0.008	0.008	0.009	0.008	**0.006**
Tamil Nadu	0.518	0.527	0.530	0.538	0.513	0.527	0.535	0.544	0.587	0.583	0.587	0.579	0.583	0.553	**0.550**
Uttar Pradesh	0.686	0.628	0.590	0.562	0.542	0.565	0.551	0.534	0.566	0.558	0.553	0.541	0.547	0.533	**0.568**
Uttarakhand	0.061	0.060	0.060	0.060	0.064	0.070	0.076	0.075	0.090	0.091	0.092	0.092	0.092	0.089	**0.077**
West Bengal	0.571	0.502	0.471	0.447	0.433	0.443	0.438	0.416	0.407	0.399	0.385	0.372	0.367	0.360	**0.429**
Average_all_states	**0.287**	**0.276**	**0.266**	**0.260**	**0.258**	**0.267**	**0.262**	**0.259**	**0.279**	**0.278**	**0.272**	**0.272**	**0.274**	**0.271**	**0.270**

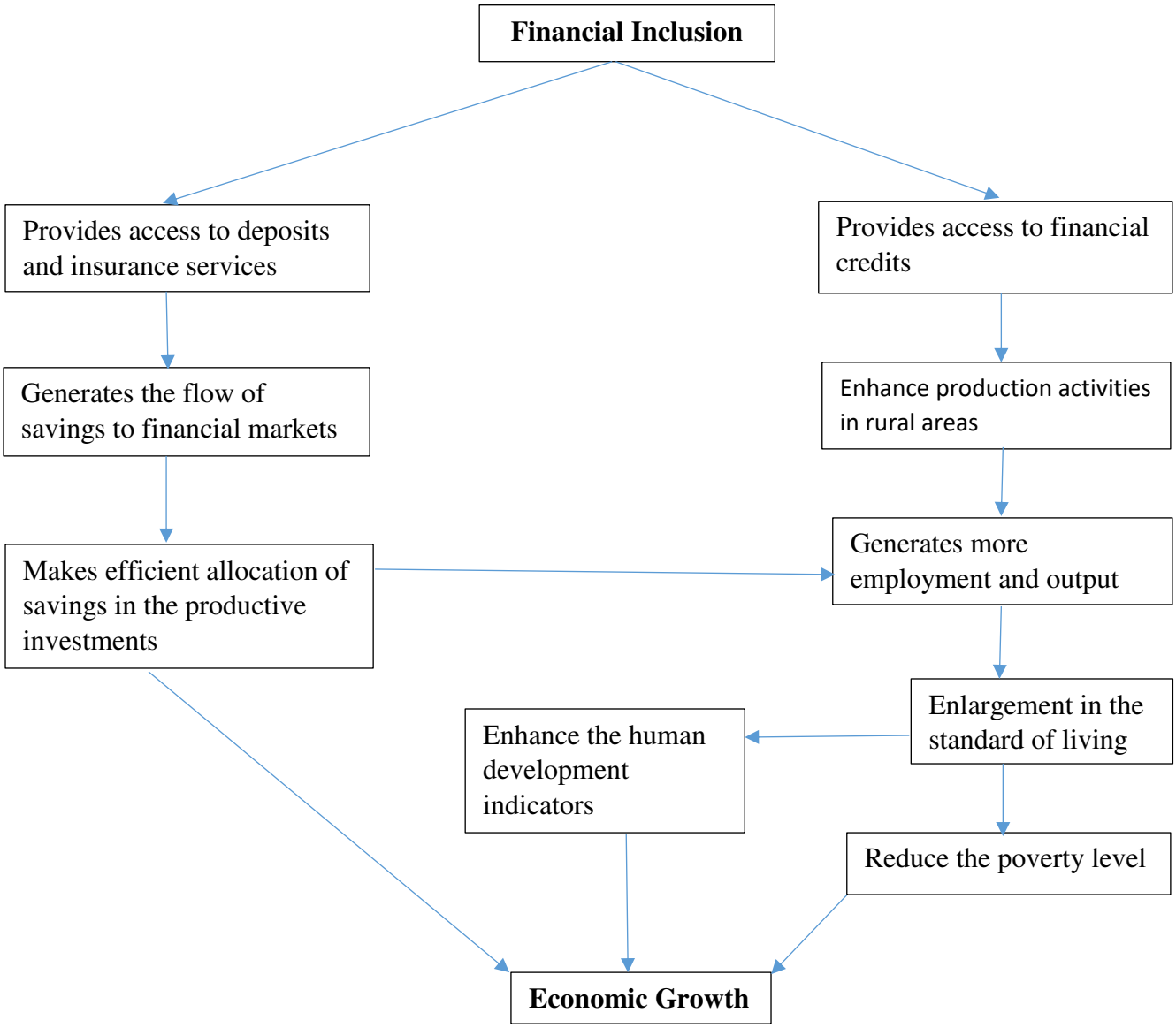
Source: Author's estimation

Figure 1. Schumpeter's Model of Economic Development



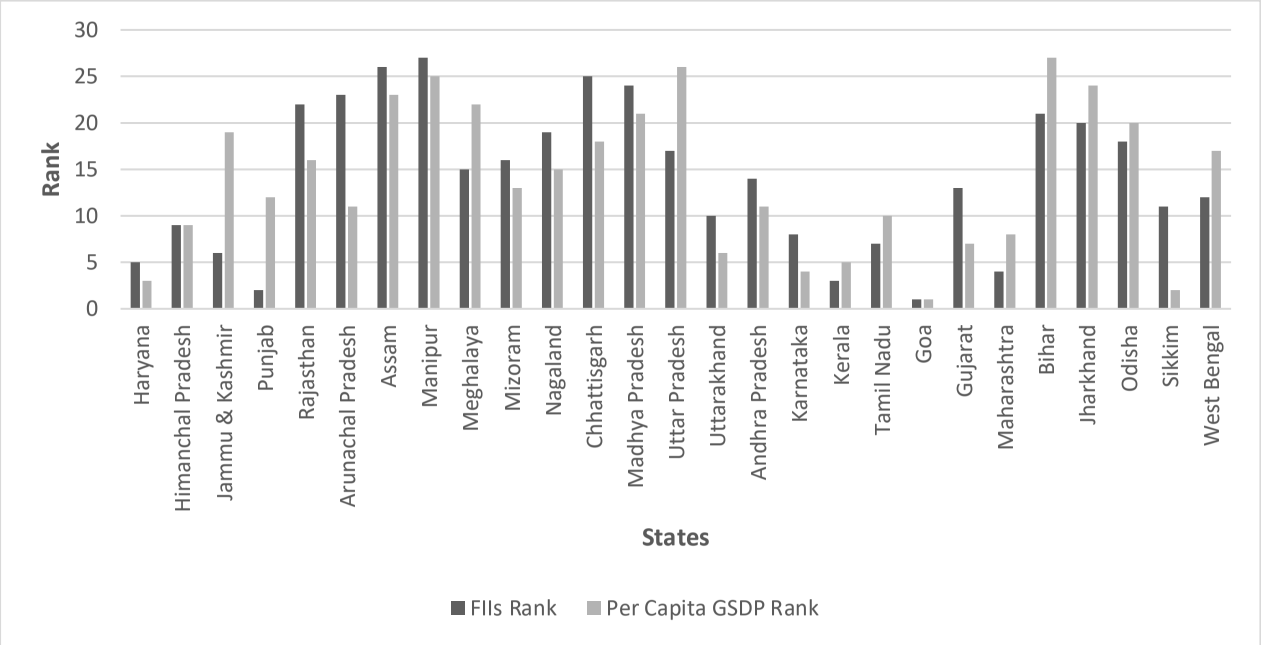
Source: Singh and Mishra (2015)

Fig 2. Financial inclusion and economic performance



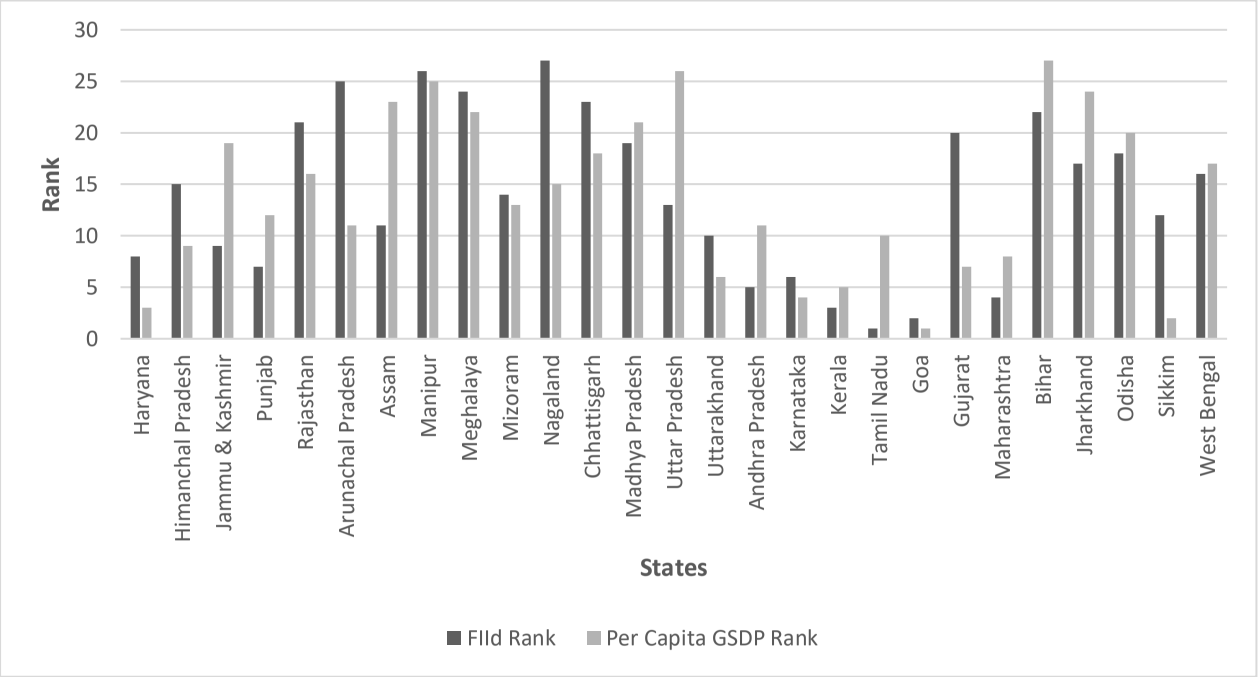
Source: Author's analysis

Fig 3. Supply side Financial Inclusion Index and States Per Capita GSDP Rank for 2017



Source: Author's analysis

Fig 4. Demand side Financial Inclusion Index and States Per Capita GSDP Rank for 2017



Source: Author's analysis