An Investigation into the Relationship Between Financial Inclusion and Economic Development of Indian States

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Abstract

The issue of inclusive growth is placed on the agenda of policy-makers across the globe. Though the governments of various countries have been considering financial inclusion as a weapon to combat poverty and to foster growth and development in the economy, there is an incongruency in the inclusion-growth nexus. This empirical study explores the relationship between these two variables in the Indian context. The researchers collect state-level data on parameters of economic development and financial inclusion over the period 2015 to 2020 to achieve the objective. The investigators compute a weighted composite index for economic development and financial inclusion of different states of India with the application of data reduction technique. The study finds a strong positive relationship between financial inclusion and economic development .

Keywords: *Financial Inclusion, Banking Penetration, Banking Usage, Status of Financial inclusion, Index of Financial Inclusion, Economic Development Index.*

Introduction

The role of banking for an economy has been highlighted in the century-old work of Walter (1873). A financial system that allows the smooth flow of funds is a boon for an economy as it supports economic growth (McKinnon, 1973). A weak financial infrastructure, on the other hand, acts as a deterrent in the growth of an economy (Sharma, 2013). Without a sound financial infrastructure, it is difficult for an economy to stand firm and therefore can prove to be a death blow for an economy (Gurley & Shaw, 1955; Angadi, 2003). The positive impact of financial development due to economic growth has been emphasized by Falahaty and Hook, whereas Law et al. (2014) stressed on developing a sound financial system as it contributes either directly (Amidzic et al., 2014) or indirectly (Jeanneney and Kpodar, 2011).

Financial inclusion is a vital issue associated with the banking sector which is also reflective of the development and well-being in the economy. The Commission on Growth and Development (2008) remarked that inclusiveness was an essential ingredient of any successful growth strategy. However, the shoddy picture of India is clear from the World Economic Forum Report (2015), which mentions that India has yet to embrace inclusive growth. The importance arises from recent evidence about how inclusion supports economic development (Masoud & Hardaker, 2012; Raza et al., 2019). According to the OECD, access to financial services leads to favorable economic growth and contributes to rise in the standard of living (Hannig & Jansen, 2010). Conroy (2008) finds the widening inequality in income due to low inclusivity in an economy. Studies have proved that lack of inclusion in the formal banking system results in a loss of almost 1% of the GDP. The deterioration impact on economic growth due to financial exclusion is cited in Angadi (2003). The contributions of Burgess and Pande (2005), Clarke et al. (2006) and Honohan (2008) highlight the negative association between poverty, disparity and access. Subrahmanyam and Acharya (2017) point to a constructive effect of financial inclusion on the growth of the economy that corroborates the findings of Ghosh (2011), Hariharan and Marktanner (2012) and Sharma (2016).

In view of the importance of financial inclusion, the Indian government has been putting serious efforts towards financial inclusion. While inclusive banking began in spirit in 1969 and 1980 with the nationalization of banks followed by a series of measures, the real driving force on financial inclusion came in 2005 after the RBI emphasized the importance of the term in its annual policy statement released in the same year. According to the RBI-initiated Committee in 2008, which was headed by C.R.Rangarajan, financial inclusion is considered to be a process of ensuring 'adequate' credit, which should be accessible to the weaker sections on time and at a low cost. The Census of 2011 highlights a wide gap in inclusiveness. NSSO data as per the 70th Round Survey results shows that at the country level, the institutional sources of credit contribute 49% in contrast to 51% comes from the non-institutional sources. The World Bank Findex Survey (2012) specifies that only 35 per cent of Indian adults owned a formal bank account. On the basis of this data, it is clear that a significant percentage of the Indian households resort to financing from informal local money lenders, who charge exorbitant rates of interest. Thus, policy-makers have taken initiatives, to spread the reach of banking, which are in line with the ambitious target of achieving cent percent inclusiveness.

In India, the process of bringing the weaker sections into the formal financial system was started with the nationalization of fourteen commercial banks in 1969, establishment of Regional Rural Banks in 1975, National Bank for Agriculture and Rural Development in 1982, commencement of the Self-Help Group Bank-Linkage Programme in 1992, opening of no-frills bank account in 2005, simplification of KYC norms and the process continues. The Modi government after coming to power launched the Pradhan Mantri Jan Dhan Yojana as a flagship programme to cover the unbanked and help them open bank accounts. The government's target is to increase inclusiveness leading to poverty alleviation and income enhancement (Burgess & Pande, 2005; Clarke et al., 2006; Honohan, 2008). The present study, therefore, aims to examine the position of different Indian states on financial inclusion and economic development and to assess their connectedness.

Theoretical framework and hypothesis development

A low inclusiveness has a direct

effect on the economy as the unorganized sector makes a low contribution to the economy (Sharma, 2013). The role of the banking sector in boosting economic growth is studied by Law et al. (2014). There are several theoretical arguments which emphasize the movement between financial inclusion and economic growth in the same direction. Easy flow of funds through banking intermediaries ensures higher flow of credit (Shaw, 1973), accumulation of capital (King and Levine, 1993) and creates a stable financial system (Demetriades & Hussein, 1996). The cue for this study is obtained from the observation by Robinson (1952) and Martinez et. al. who presents dual views about the effect of financial inclusion. Scholars opine the positive impact on the economy through poverty alleviation and income disparity reduction (Brune et al., 2011; Sarma & Pais, 2011; Le & Nguyen, 2020), whereas, few researchers talk about a negative relationship (Park & Mercado, 2015; Boukhatem, 2016) and an insignificant impact on poverty and income disparity (Seven & Coskun 2016; Neaime & Gaysse, 2018). Hence, the inconsistency in the results is evident.

There are various Indian studies that find how financial inclusiveness supports economic growth (Ghosh, 2011; Chibba, 2009; Chattopadhyay, 2011; Ram et al., 2012). Sahu (2013) points out the relatively poor level of financial inclusiveness in India. The IMF Financial Access Survey (2017), states that the number of loan account and deposit account per thousand adults in 2016 stood at 170.77 and 173127, respectively, which is quite low.. Hence, in order to increase the inclusiveness level, remarkable initiatives have been taken by the government of India. Thus, the area of inclusive growth is gaining attention which makes it pertinent to identify the contextual connection between inclusiveness and growth. On the basis of literature review, it is evident that financial inclusion has drawn interest of researchers worldwide. Though many studies have been carried out on different facets of financial inclusion, there is a disagreement in the relationship between these two variables considered for the study. In the light of existing incongruence, the researchers in this study determine the relationship between the two key development parameters in the Indian context. For this purpose, principal component analysis is used to obtain data driven weight to computer indice, after that statistical measures is used. Hence, the investigation is a methodological improvement over related studies and helps to judge the robustness of the previous contributions.

The manifold objectives of this research are:

i. To compute the index of financial inclusion of the Indian states
ii. To measure the index of economic development of the Indian states
iii. To examine the relationship between the two.

Accordingly, the alternative hypothesis of the study is:

H_1: There is a significant relationship between financial inclusion and economic development.

The paper is structured as follows. Section 1 introduces the research issue to the readers which is followed by section 2, which discusses the theoretical framework of the study and frames the hypothesis based on the objectives. Section 3 elaborates the research design and the three dimensions of financial inclusion. Section 4 makes a detailed discussion about the findings on economic development index and financial inclusion index and their relationship. Section 5 concludes the findings of the study.

Research Design

Research design is a vital part of any research as it lays the foundation of the research. The study is based on secondary data and uses information collected from the RBI website, Niti Aayog, Office of the Registrar General & Census Commissioner, India. The empirical investigation considers data from 2015 to 2020. For investigating the position of financial inclusion and economic development in different states of India, secondary data is collected for twenty eight Indian states. The required index of financial inclusion (IFI) of the Indian states is computed using three dimensions viz. penetration, availability and usage. The first dimension (banking penetration) uses number of bank accounts per lakh population for measurement. The second dimension considers bank branches per lakh population, whereas the third dimension uses the ratio between total credit plus deposit to GSDP. The dimensional index is computed using the formula given below after which the composite index is calculated:

$$d_i = w_i * (A_i - m_i) / (M_{i-} m_i)$$

where, w_i=Weight attached to dimension i

A_i = Actual value in dimension i

M_i = Upper limit in dimension i

m_i= Lower limit in dimension I

The above index is computed using the methodology as applied by Sarma (2010).

For the latter, the Index of Financial Inclusion (IFI) of each sample state is calculated on the basis of normalized inverse euclidean distance of the point D from the ideal point I= $((W_1, W_2, \ldots . W_n)$.

The formula applied is:

IF Ii = 1 – [(w1-d1)2+(w2-d2)2+[(w3-d3)2]1/2 ([w12+w22+w32]1/2 ………………(1)

Where,

w_1 = Weight of penetration dimension,

w_2 = Weight of availability dimension

w_3 = Weight of usage dimension

d_1 = Penetration dimensional index

d_2 = Availability dimensional index

d_3 = Usage dimensional index

The index computing method is adopted from Sarma (2010). The researchers also compute the Economic Development Index (EDI) in the second step. Here for measuring economic development, we have considered different measures of economic development like per capita income, gross state domestic product (GSDP) and net state domestic product (NSDP). Instead of giving arbitrary weight to different measures for computing composite indexes, the data-driven weight technique is applied here on the basis of weights derived from principal component analysis. The index is computed for each state using the following formulae:

EDI = (w1x1+w2x2+w3 x3) / (w1+w2+w3)…………..(2)

where,

w_i= Weightage for i-th dimension which is obtained using principal component analysis

$x_1 = X_{1i}$ = Per Capita Income
$x_2 = X_{2i}$ = GSDP (Gross State Domestic Product)
$x_3 = X_{3i}$ = NSDP (Net State Domestic Product)

Analysis and Findings

4.1 Determining state-level economic development index (EDI)

The results obtained in statistical tests in computing the EDI are given below. Prior to the direct use of factor analysis, the KMO and Bartlett's Test of Sphericity are carried out. The researchers find the KMO value to be 0.784 and the p-value for Bartlett's Test to be less than 0.001. Thus, the suitability of data for factor analysis is established. The result of PCA shows that weight for the three variables are 0.996 (w1 for per capita income), 0.997 (w2 for Per capita GSDP) and 0.998 (w3 for Per capita NSDP). The economic development index for each state is computed using the following formula:

$$EDI = (w_1x_1+w_2x_2+w_3\ x_3)/(\ w_1+w_2+w_3)$$

4.2 Determining state-level financial inclusion index (IFI)

A similar process is applied for computing the financial inclusion index of the sample states. For this purpose, the three dimensions under financial inclusion are considered. The related secondary data for these three dimensions are collected from the website of the Reserve Bank of India. To find the corresponding weights of these three dimensions, principal component analysis is applied. The KMO value is 0.504 which exceeds the desirable value of 0.50, whereas the p-value for Bartlett's test is less than 0.1%. The weights as obtained using PCA are: 0.963 for the 'penetration', 0.936 for 'availability' and 0.476 for 'usage' variable. Then the two indices are measured on the basis of normalized inverse Euclidean distance as already mentioned above.

4.3 Descriptive statistics

The descriptive statistics give us information relating to the characteristic of the data being dealt with. Thus, the usual statistical measures are focused upon as given below.

Table I
Descriptive statistics of EDI and IFI

Year	EDI				IFI			
	Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
2015	0.361	0.193	0.101	1	0.212	0.159	0.013	0.835
2016	0.347	0.195	0.093	1	0.222	0.156	0.019	0.824
2017	0.341	0.194	0.094	1	0.235	0.156	0.033	0.837
2018	0.35	0.2	0.094	1	0.242	0.153	0.031	0.832
2019	0.371	0.204	0.101	1	0.252	0.156	0.034	0.856
2020	0.39	0.209	0.109	1	0.255	0.16	0.035	0.862

Source: Computed by researchers

Note: The above computation is done based on the RBI data collected for the states

Mean values of economic development index (EDI) (see table 1) of all the years are a little bit close and the highest mean value of EDI is obtained 0.390 in 2020 and the lowest is 0.341 obtained in 2017. The minimum values of EDI differ marginal value from one year to another which is also observed in the case of standard deviation (SD). On the other hand, the average index of financial inclusion shows a lowest value of 0.212 in 2015, whereas the highest value is 0.255 in 2020. A continuous upward trend is observed in IFI mean value during the study period.

4.4 EDI and IFI: A state-wise analysis

The intention of computing the above two indices is to find the relationship between them. First, the researchers compute the value of the two indices for the sample states for the six years of the study period. The table below shows the value of EDI and IFI in different years.

Table II: Economic Development Index of Indian states

State	2015	2016	2017	2018	2019	2020
Andhra Pradesh	0.324	0.322	0.329	0.334	0.357	0.384
Arunachal Pradesh	0.394	0.349	0.333	0.341	0.370	0.395
Assam	0.187	0.188	0.185	0.188	0.197	0.206
Bihar	0.101	0.093	0.094	0.094	0.101	0.109
Chhattisgarh	0.259	0.229	0.227	0.227	0.245	0.256
Goa	1.000	1.000	1.000	1.000	1.000	1.000
Gujarat	0.452	0.433	0.433	0.447	0.486	0.513
Haryana	0.560	0.542	0.544	0.528	0.555	0.592
Himachal Pradesh	0.440	0.419	0.408	0.411	0.427	0.447
Jammu & Kashmir	0.224	0.232	0.221	0.219	0.243	0.250
Jharkhand	0.202	0.163	0.165	0.170	0.186	0.187
Karnataka	0.454	0.449	0.438	0.458	0.492	0.518
Kerala	0.467	0.442	0.433	0.442	0.481	0.503
Madhya Pradesh	0.198	0.193	0.205	0.207	0.223	0.248
Maharashtra	0.470	0.454	0.454	0.430	0.454	0.478
Manipur	0.190	0.175	0.164	0.185	0.192	0.211
Meghalaya	0.233	0.217	0.206	0.202	0.212	0.219
Mizoram	0.368	0.356	0.360	0.378	0.397	0.440
Nagaland	0.277	0.253	0.246	0.254	0.265	0.285
Orissa	0.223	0.202	0.203	0.218	0.238	0.252
Punjab	0.384	0.365	0.354	0.350	0.367	0.371
Rajasthan	0.270	0.257	0.247	0.249	0.267	0.278
Sikkim	0.754	0.756	0.740	0.871	0.915	0.956
Tamil Nadu	0.449	0.426	0.405	0.426	0.458	0.487
Telangana	0.435	0.429	0.433	0.444	0.497	0.534
Tripura	0.243	0.255	0.248	0.248	0.272	0.294
Uttar Pradesh	0.151	0.146	0.141	0.145	0.156	0.160
Uttarakhand	0.480	0.454	0.433	0.451	0.467	0.482
West Bengal	0.240	0.230	0.224	0.224	0.246	0.259

Source: Calculation by researchers *Telangana State is formed in 2014

Note: The above computation is done based on the RBI data collected for the states.

Table III: Financial Inclusion Index of Indian states

State	2015	2016	2017	2018	2019	2020
Andhra Pradesh	0.264	0.252	0.259	0.261	0.263	0.259
Arunachal Pradesh	0.097	0.105	0.124	0.136	0.138	0.135
Assam	0.085	0.097	0.117	0.123	0.111	0.133
Bihar	0.049	0.071	0.082	0.086	0.104	0.107
Chhattisgarh	0.121	0.143	0.16	0.167	0.175	0.187
Goa	0.835	0.824	0.837	0.833	0.851	0.86
Gujarat	0.211	0.212	0.223	0.222	0.239	0.231
Haryana	0.293	0.307	0.323	0.351	0.364	0.376
Himachal Pradesh	0.338	0.348	0.362	0.376	0.371	0.382
Jammu & Kashmir	0.226	0.233	0.246	0.268	0.277	0.263
Jharkhand	0.115	0.138	0.149	0.159	0.152	0.158
Karnataka	0.311	0.309	0.322	0.324	0.343	0.354
Kerala	0.357	0.36	0.361	0.375	0.399	0.393
Madhya Pradesh	0.13	0.142	0.144	0.152	0.151	0.155
Maharashtra	0.258	0.256	0.259	0.264	0.264	0.272
Manipur	0.013	0.019	0.033	0.045	0.045	0.041
Meghalaya	0.102	0.111	0.124	0.121	0.128	0.126
Mizoram	0.145	0.165	0.191	0.202	0.217	0.212
Nagaland	0.03	0.029	0.034	0.039	0.032	0.034
Orissa	0.162	0.17	0.185	0.182	0.191	0.201
Punjab	0.395	0.414	0.438	0.445	0.447	0.444
Rajasthan	0.114	0.132	0.139	0.141	0.152	0.156
Sikkim	0.249	0.274	0.283	0.298	0.301	0.338
Tamil Nadu	0.283	0.285	0.291	0.302	0.312	0.322
Telangana	0.227	0.301	0.326	0.301	0.319	0.301
Tripura	0.173	0.196	0.211	0.228	0.191	0.216
Uttar Pradesh	0.13	0.137	0.142	0.143	0.147	0.142
Uttarakhand	0.295	0.315	0.335	0.341	0.341	0.351
West Bengal	0.159	0.179	0.193	0.199	0.192	0.198

Source: Calculation by researchers

*Telengana State is formed in 2014

Note: The above computation is done based on the RBI data collected for the states.

From the above tables (see table nos. 2 and 3) of Economic Development Index (EDI), it is clear that in terms of the relative score, Sikkim is far ahead of the other states. The states like Maharashtra, Gujarat, Haryana, Karnataka, Kerala, Himachal Pradesh and Tamil Nadu are distantly placed and these are the states that are in a comparatively better economic position. However, the North-Eastern states, Bihar, Jharkhand and Jammu and Kashmir are placed low. The states that find them are placed in the middle include Orissa, Chhattisgarh, Rajasthan and others. In the same tune, when the researchers look into the Inclusion Index, it is observed that the IFI of Goa is extremely high and it is far ahead of the others. Kerala, Karnataka, Himachal Pradesh, Sikkim and Punjab are in a comparatively better position compared to Bihar, Jharkhand, Odisha, Maharashtra, Madhya Pradesh and most of the north-eastern states. The IFI of Tamil Nadu, West Bengal, Orissa, Tripura, Gujarat and Jammu and Kashmir are in the medium category. It is therefore seen that the IFI value of the states is not static; the index of financial inclusion for many states increases or decreases in different years but IFI of many of the states like Kerala, Uttar Pradesh, Tamil Nadu, West Bengal, Madhya Pradesh and Uttarakhand) has gradually increased during the period.

4.5 Relationship between EDI and IFI

In this section, the investigators estimate the correlation between EDI and IFI applying Spearman's and Kendall's rank correlation methods. The results are given in table No. 5 below:

Table IV: Rank correlation between EDI and IFI

Year	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Rank correlation value	0.737***	0.795***	0.783***	0.780***	0.790***	0.782***
(Spearman's rho)	0	0	0	0	0	0
Rank correlation value	0.527***	0.594***	0.566***	0.580***	0.605***	0.586***
(Kendall's tau)	(0.000).	0	0	0	0	0

Source: Computed by researchers; Figures in the parentheses represent p-value; ***represent significant at 1% level

The above table shows the rank correlation between the two indices to point out the co- movement of the two sets of values. The rank correlation values for the period from 2015 to 2020 show that the extent of relationship is good and is highly statistically significant below 1% level for all the years. With respect to the Spearman's rho, the correlation lies between 0.737 and 0.795 which also documents a strong positive relationship. Kendall's tau measure also shows a strong relationship between the two indices. Thus, a direct inter-connectedness that is found in many other developed countries is also valid in the Indian context. Thus, policy-makers have to find out the option for growth and inclusiveness so that there is a percolation of benefits through economic development to all strata of the society irrespective of caste, religion, ethnicity, region, gender, language and other forms of diversity.

Concluding remarks and policy implications

A financial system with a high level of inclusivity is a necessity in an economy as it permits the easy flow of funds to different sectors of the economy in line with the requirements. Low financial inclusivity can disturb the foundation of a financial system by hampering the financial structure that is a prerequisite for economic growth and development (Angadi, 2003). The presence of a low inclusiveness level promotes and gives scope to local money lenders who work parallel to the formal system. The governments of countries have been devising mechanisms to create a stable and highly inclusive economy. The responsibility for improving the inclusivity level in the economy has been taken up by the government which is manifested in various developments and policy changes that are observed around us.

In this research contribution, the contributors have presented a picture of different states of India about their financial inclusion and economic development level by calculating indices. The scores show that there has not been major change in their positions with regard to these parameters. The study shows the relatively poor development in the north-east states with regard to financial inclusion and economic development which calls for a special drive by the government to uplift the position of the seven sister states. In respect of the Economic Development Index score, Sikkim leads, leaving the other states like Maharashtra, Gujarat, Haryana, Karnataka, Kerala, Himachal Pradesh and Tamil Nadu far behind. It is sad to note the poor position of all the North-Eastern states along with Bihar, Jharkhand and Jammu and Kashmir. The states like Orissa, Chhattisgarh, Rajasthan and others are placed in between. The study also shows that with respect to the inclusion index level, Goa leads far ahead of states like Kerala, Karnataka, Himachal Pradesh, Sikkim and Punjab that are distantly placed. Bihar, Jharkhand, Odisha, Maharashtra, Madhya Pradesh and most of the north-eastern states have a relatively low place. The inclusion level of Tamil Nadu, West Bengal, Orissa, Tripura, Gujarat and Jammu and Kashmir are in the medium category. It is also observed that the IFI value of the states is not static; the index of financial inclusion for most of the states increase or decrease in different years but the inclusion index of Kerala, Madhya Pradesh, West Bengal, Uttar Pradesh, Tamil Nadu and Uttarakhand have gradually increased during the period. It is, therefore, necessary to take commensurate measures in those states that have been lagging constantly. For boosting the economic development in those states, infrastructure needs to be boosted which will definitely facilitate the process of development and reduce regional disparity that is very prominent in India.

The other aspect covered by the researchers looked at how economic development and financial inclusion are related. The test conducted by the investigators for finding the association between these indices shows a strong positive and significant relationship between them. This inference of the study finds support from the previous studies of Ghosh (2011) and Beck et al. (2007). Ghosh (2011) in the investigation established a positive connection between financial outreach and usage of financial services (that mainly includes banking) and the growth rate in economic parameters at the state level. The study, however, does not agree with the opinion of Barajas et al. (2012), who do not agree with the positive connection between development of the financial system and growth in the economy. The investigation in this paper finds a significant and strong association between the two dimensions of interest at the state level. This finding can definitely be further extended in a separate study to examine the extent to which it supports the research inferences as drawn in Apergis et al. (2007) and Pradhan (2010) who find a bi-directional relationship between the two parameters. The conclusions are also in line with the conclusion drawn in Ndebbio (2004) and Masoud and Hardaker (2012) regarding how financial deepening and economic growth are related. Till now, the financial inclusion, though on the rise, is far from the target set by the government. Thus, bankers need to resort to not just physical banking but also technology-based solutions by making use of technology like mobile banking, internet banking and customized services along with financial literacy and education.

Scope for further study

The empirical study has come up with important findings. In the future studies in the related area, there is scope to look into the relationship between development and financial inclusion for different time durations. Moreover, as mobile penetration has been growing at an immensely fast pace, this issue also needs to be considered as one of the dimensions for measurement of inclusion levels. In the future endeavors, researchers can look into the financial and economic development index in the post-Covid situation which will help to understand what has been the change at the state level in respect of these two indices.

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