Linking Financial Inclusion and Human Development in India with Special Reference to Maharashtra

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1. Financial inclusion,
2. Human development,
3. Convergence,
4. Maharashtra

Abstract

Financial inclusion refers to a process that ensures the ease of access, availability and usage of the formal financial system for all members of an economy. Financial inclusion broadens the resource base of the financial system by developing a culture of savings among large segment of rural population and plays its own role in the process of economic development. The process of financial inclusion also reinforces the process of human development. The paper presents the conceptual framework on the association between inclusive finance and human development. Empirical evidences on the association between IFI and HDI of India in general, and Maharashtra in particular, are presented in this paper. The convergence of the districts of Maharashtra in financial inclusion is computed to identify whether there is a reduction in disparity in the financial inclusion of the 35 districts of Maharashtra. There is found to be a significant positive correlation between these two development variables in India and in the districts of Maharashtra. It is also empirically proved that the districts with lower financial inclusion are converging towards the districts with higher financial inclusion in Maharashtra

INTRODUCTION

Financial inclusion refers to a process that ensures the ease of access, availability and usage of the formal financial system for all members of an economy. It refers to universal access to a wide range of financial services at a reasonable cost. These include not only banking products but also other financial services such as insurance and equity products. Financial inclusion is of considerable importance to a country like India which has saving investment gap of around 35% as per the last economic survey. Financial inclusion broadens the resource base of the financial system by developing a culture of savings among large segment of rural population and plays its own role in the process of economic development. Further, by bringing low income groups within the perimeter of formal banking sector; financial inclusion protects their financial wealth and other resources in exigent circumstances. Financial inclusion also mitigates the exploitation of vulnerable sections by the usurious money lenders by facilitating easy access to formal credit.

The process of financial inclusion reinforces the process of human development. There are, in fact, two-way causations; one induces the other and vice-versa. Human development is a process of enlarging people's choice. The first human development report of United Nations Development Programme published in 1990 identified three important indicators reflecting reasonable choices of people for sustaining a life with dignity- the choices being to lead a long and healthy life, to be educated and to enjoy a decent standard of living. It can be stated that covering the deprived under the formal financial system safety net can be a major determinant of having higher human development in the society. It is often said that financial exclusion is manifestation of social exclusion, hence it needs to be seen that how far these two indictors are related to each other.

This paper is divided into five sections. The paper starts with the section on data and methodology used for constructing relationship between the financial inclusion and human development in India and the various districts of Maharashtra. Methodological issues relating to sigma convergence is also presented in this section. The trend of financial inclusion in India is outlined thereafter. Later the paper presents the conceptual framework on the association between inclusive finance and human development. Empirical evidences on the association between IFI and HDI of India in general, and Maharashtra in particular, is also presented in this section. The convergence of the districts of Maharashtra in financial

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inclusion is computed to identify whether there is a reduction in disparity in the financial inclusion of the 35 districts of Maharashtra. The concluding remarks are presented in the last section.

Data and Methodology

The paper attempts to establish whether the financial inclusion and human development are correlated with each other in India in general and the state of Maharashtra in particular. In order to do so two most important indicators of financial inclusion and human development are being used.

CRISIL Inclusix, a financial inclusion index developed by CRISIL is being used as a measure of financial inclusion. It is a relative index that has a scale of 0 to 100, and combines three very critical parameters of basic financial services — branch penetration (BP), deposit penetration (DP), and credit penetration (CP) — into one single metric. CRISIL Inclusix uses five parameters as proxies to measure the three key dimensions of financial inclusion. The branch penetration is measured by number of bank branches per lakh population in a district and number of loan accounts per lakh population in a district. The parameters used for measuring credit penetration is number of small borrower loan accounts as defined by RBI per lakh of population in a district (small borrowers = borrowers with a sanctioned credit limit of up toRs.2 lakh) and number of agricultural advances per lakh of population in a district. Number of savings accounts per lakh of population in a district is used to measure the deposit penetration of the banks in the district.

The calculation of CRISIL Inclusix involves Normalisation of parameters using the Min-Max method of normalisation

$$Xi \, (Normalised) = \frac{Xi - X \, (min)}{X(max) - X(min)} * 100$$

Where,

Xi value for a particular parameter for the district 'i';

X (min) minimum value for a particular parameter observed across all districts;

X (max) maximum value for a particular parameter observed across all districts;

Normalisation converts data for every parameter into numbers between 0 and 100, with 0 depicting the worst performer and 100 the best performer in the parameter. The normalised values of each of the five parameters may be referred to as the parameter-indices.

In the second step the aggregation of the three dimension indices (BP, average of the three CP parameter indices, and

DP) is done using displaced ideal method. The three dimension-indices, BP, CP, and DP, may be represented in a three-dimensional space with 0 as the minimum value and 100 as the maximum (ideal) value for each of three dimensions. Each district may be represented by a particular point in the three dimensional space (0, 0, 0 and 100, 100, 100) shown above.

CRISIL Inclusix is measured as the inverse of the Euclidean distance from the ideal point (100, 100, 100). 'Euclidean Distance Method' is used to calculate the distance between any two points in an n-dimensional space.

$$CRISIL \; Inclusix - District \; (I) = \frac{\sqrt{(100-BPi)*2 + 100-CP)*2 + (100-DPi)*2}}{\frac{3}{}}$$

In the formula, the numerator of the second component is the Euclidean distance of the district 'i' from the ideal point (100, 100, 100), normalising it in order to make the value lie between 0 and 100, and the inverse distance is considered so that the higher value corresponds to higher financial inclusion. This method of aggregation does away with the assumption of perfect substitutability among the three dimensions of the averaging method. So, a good performance in one dimension, say DP, does not fully compensate for poor performance in another dimension, say CP. For a district to score well in financial inclusion, it should score well in all the dimensions.

In order to measure the Human Development the data is derived from Inequality adjusted HDI report of Indian states of UNDP in 2011 and Maharashtra Human development report 2012. The HDI represents a national average of human development achievements in the three basic dimensions: a long and healthy life, knowledge and a decent standard of living. Like all averages, the HDI conceals disparities in human development across the population within the same country. Two countries with different distributions of achievements can still have the same average HDI value.

The IHDI takes into account not only the average achievements of a country on health, education and income, but also how those achievements are distributed among its population by "discounting" each dimension's average value according to its level of inequality.

The IHDI for 19 states of India has been calculated in the Inequality adjusted HDI report of Indian states of UNDP in 2011 and the CRISIL Inclusix score of these 19 states is compared to find the correlation between the human development and financial inclusion.

The Maharashtra Human Development Report gives the HDI of the 35 districts of Maharashtra and the CRSILS Inclusix score of these districts is taken to find the correlation between these two indicators.

Sigma convergence is used to estimate the reduction in the variation of financial inclusion the districts of Maharashtra. The concepts of sigma convergence is said to exist if the dispersion of any indicator in this case financial inclusion (D_i,t) across regions decreases over time. This implies a tendency of financial inclusion to be equal across regions over time, i.e $\sigma_{i,t+\tau} < \sigma_{i,t}$ where $\sigma_{i,t}$ is the standard deviation of log (D_i,t) across region i in time t.

Association between financial inclusion and human development

Outreville (1999) established a positive correlation between measures of financial development and measures of human capital development.Using an index of financial inclusion (Sarma M, Pais J,2008), described the broad relationship between financial inclusion and human development

between the countries. They found that level of human development and that of financial inclusion are strongly positively correlated, though few exceptions exist.

Cross-country regressions have shown that economies with better-developed financial systems experience faster drops in income inequality and faster reductions in poverty levels. Financial depth can have direct and indirect effects on small firms and poor households (Beck, Demirgüç- Kunt, and Honohan 2008).Empirical evidence suggests that improved access to finance is not only pro-growth but also propoor, reducing income inequality and poverty (Beck, Demirgüç-Kunt, and Honohan 2008, 2009).

The relationship between financial inclusion and human development has been succinctly given by Laha A, (2015) in the paper on "Association between Financial Inclusion and Human Development in South Asia : A Cross- Country Analysis with Special Reference to India."
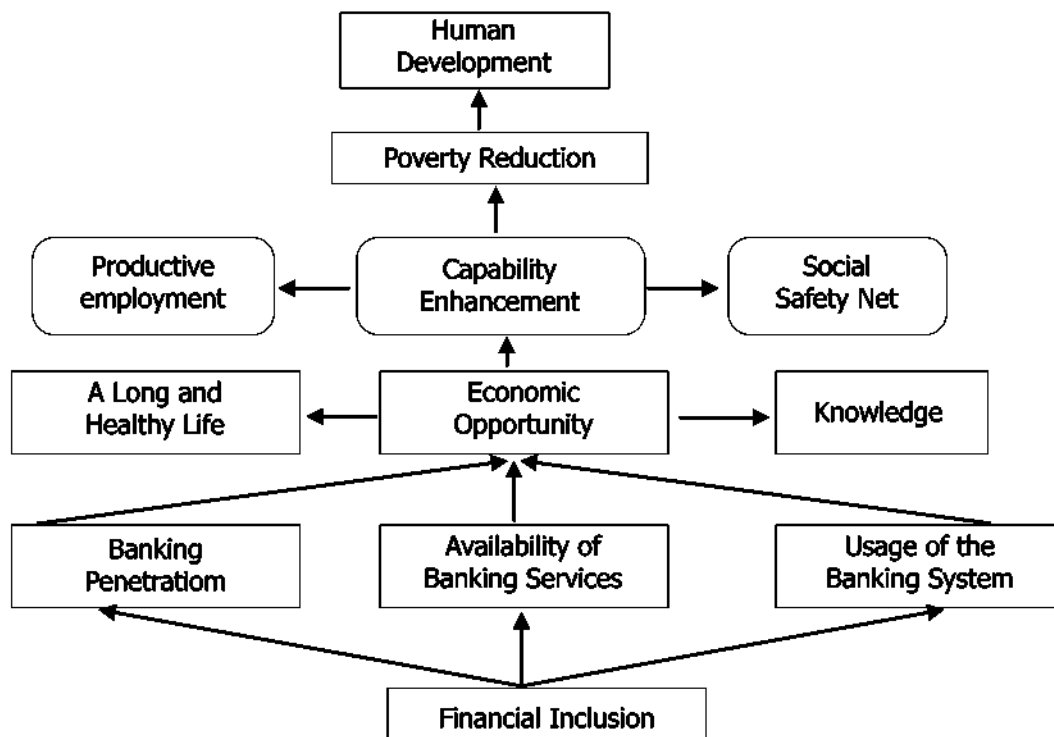
The above clearly shows that an access to formal financial system gives access to education, health and economic opportunity of the marginalised and thereby reducing poverty and improving human development.

In order to examine whether there exist high degree of

statistical correspondence between two sets of rank between CRISIL Inclusix to measure financial inclusion and inequality adjusted HDI, the study estimated the two indicators for 19 states in 2011. Table 1 gives the values of these two indicators in these states:

Table 1: CRISIL Inclusix and IHDI of Indian states, 2011

States	CRISIL Inclusix	IHDI
Andhra Pradesh	64.8	0.332
Assam	30.4	0.341
Bihar	25.5	0.303
Chhattisgarh	28.8	0.291
Gujarat	40.6	0.363
Haryana	49.3	0.375
Himachal Pradesh	58.4	0.403
Jharkhand	32.1	0.308
Karnataka	61.4	0.353
Kerala	80.04	0.52
Madhya Pradesh	33.1	0.29
Maharashtra	40.7	0.397
Orissa	43.3	0.296
Punjab	56.8	0.41
Rajasthan	34.8	0.308
Tamil Nadu	64.8	0.396
Uttar Pradesh	35.2	0.307
Uttarakhand	52.4	0.345
West Bengal	31.4	0.36

Source: Author's compilation

These two indicators show a high level of positive correlation between each other. The Pearson correlation coefficient was computed to assess the relationship between the IHDI and CRISIL Inclusix. The following table

Table 2: Correlation coefficient between Inclusix and IHDI

	CRSIL Inclusix	IHDI
CRSIL Inclusix	1	
IHDI	0.750	1

Source: Author's calculations

There is a positive correlation between the two variables, r = 0.750, n = 19, p = 0.002. Hence it can be said that the correlation coefficient is found to be statistically significant at 1% level of significance.

A further analysis to classify the states on the basis of level of human development and financial inclusion is carried out. Hierarchal method of cluster analysis was used to divide these states into four clusters based on the level of human development and financial inclusion. Table 3 details the cluster of the states classified on the above two dimensions:

Table 3: Cluster analysis for FI and HDI in India

Cluster	States
Very High FI & HDI	Kerala
High FI & HDI	Andhra Pradesh, Himachal Pradesh, Karnataka, Punjab Tamil Nadu
Average FI & HDI	Gujarat, Haryana, Maharashtra, Uttarakhand
Low FI & HDI	Assam, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh Orissa, Rajasthan ,Uttar Pradesh,West Bengal

Kerala is having a very high HDI and Financial inclusion and the only state in this category. The primary reason appears to be the high literacy rate in this state and awareness amongst the people to use the formal financial system. There are nine states that fall in the low HDI and Financial inclusion cluster. These are also the states which have low level of development on various parameters like literacy rate, life expectancy etc.

Relationship between development and financial inclusion in Maharashtra

The paper also attempts to establish that whether the human development and financial inclusion show a similar behaviour at the state levels as computed at the national level. As per the CRISIL Inclusix the all India Inclusix score is relatively low at 40.1 on a scale of 100. The Financial inclusion score for Maharashtra in 2011 is estimated at 37.5, an increase of 4.3 from the score of 2009 which stood at 33.2. The state ranked 19th in India in terms of financial inclusion.

Table 4 gives the value of the two dimensions in the 35 districts of Maharashtra in 2011:

Table 4 : Inlcusix and HDI for Maharashtra

District	CRISIL Inclusix	HDI
Ahmednagar	25.1	0.72
Akola	35.6	0.722
Amravati	35.4	0.701
Aurangabad	34.3	0.727
Beed	26.8	0.678
Bhandara	33.1	0.718
Buldhana	31.5	0.684
Chandrapur	35.1	0.718
Dhule	20.9	0.671
Gadchiroli	23.1	0.608
Gondia	27.6	0.701
Hingoli	25.7	0.648
Jalgaon	22.3	0.723
Jalna	34.4	0.663
Kolhapur	33.1	0.663
Latur	24.6	0.663
Mumbai	81.3	0.841
Mumbai Suburban	78.7	0.841
Nagpur	44.2	0.786
Nanded	32.8	0.657
Nandurbar	16.2	0.604
Nasik	26.7	0.746
Osmanabad	24.1	0.649
Parbhani	37.5	0.683
Pune	46.6	0.814
Raigad	34.7	0.759
Ratnagiri	42.1	0.732
Sangli	31	0.742
Satara	28	0.742
Sindhudurg	48.8	0.753
Solapur	29.1	0.728
Thane	30.4	0.8
Wardha	46.6	0.723
Washim	27.6	0.646
Yavatmal	31.2	0.7

Source: Author's compilation

The Pearson coefficient of correlation between in the Human Development Index and the financial inclusion index works out to be:

Table 5 : Correlation coefficient in Maharashtra

	CRISIL Inclusix	HDI
FI2011	1	
HDI	0.733	1

Source: Author's compilation

There is a positive correlation between the two variables, r = 0.733, n = 35, p = 0.000. Hence it can be said that the correlation coefficient is found to be statistically significant at 1% level of significance

Further five clusters of these districts can be formed to know the similarities between the district in the level of HDI and FI. Each cluster shows that the district in the cluster is homogeneous whereas there is heterogeneity amongst the districts of each cluster

Table 6 : Cluster analysis of the districts of Maharashtra

Clusters	Districts
Very high HDI & FI	Mumbai, Mumbai Suburban
High HDI & FI	Nagpur , Pune, Thane
Above Average HDI & FI	Ratnagiri, Sindhudurg, Wardha
Average HDI & FI	Ahmednagar, Akola, Amravati, Aurangabad, Bhandara, Buldhana, Chandrapur Gondia, Jalgaon, Nasik, Parbhani, Raigad, Sangli, Satara, Solapur, Yavatmal
Low HDI & FI	Beed, Dhule, Gadchiroli, Hingoli, Jalna, Kolhapur, Latur, Nanded, Nandurbar, Osmanabad, Washim

Source: Author's calculations

Mumbai and Mumbai suburban have the highest HDI and FI and cans also be considered as outliers in the data. Mumbai being the financial capital of the country has larger density of financial intuitions compared to rest of the state.

There are eleven district of the state which have been classified as having low financial inclusion and HDI and sixteen districts with average HDI and FI. Hence lot needs to be done in n the state to include the lower income districts in the mainstream financial system.

Sigma convergence of the districts

It is not only of importance to know the current status of the HDI and FI but would be of greater interest to know whether the variation in the financial inclusion in these 35 districts is reducing or not. A single point analysis cannot help to answer whether the steps taken by the state have been able to achieve their objective of financial inclusion. Therefore sigma convergence is the best way to interpret whether the variation in the thirty five districts of the state is decreasing or not.

The seminal paper of Barro and Sala-i-Martin (1992) defines sigma convergence as the reduction in the value of per capita income (variable in their study) across the economies over a period of time. A similar method to calculate sigma convergence in South East Asian nations has been used by Laha, A(2015) wherein the value of standard deviation of the logarithms of index of financial inclusion is taken to determine the sigma convergence. A reduction in value shows that the disparity in the financial inclusion is decreasing overtime.

Using the similar methodology the value of the logarithm of the financial inclusion index CRISIL Inclusix is calculated for five years starting from 2009 till 2013. Table 7 indicates that the standard deviation of the logarithms of index of financial inclusion is gradually declines overtime from a high value of 0.367 in 2009 to a significantly lower value of 0.268 in 2013.

Table 7 : Results of convergence analysis

Year	Standard Deviation of CRISIL Inclusix
2009	0.367234
2010	0.349336
2011	0.328206
2012	0.309778
2013	0.268051

Source: Author's calculations

A decrease in the value of the standard deviation of the logarithm of Financial inclusion index shows that the districts having lower level of financial inclusion continue to converge with the higher levels in Maharashtra .

Figure 2 : Sigma convergence of financial inclusion in Maharashtra
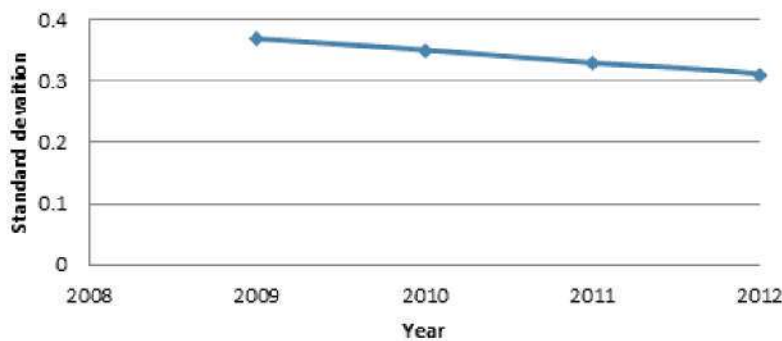
CONCLUSION

The paper sheds some light on the trend of convergence in the indicators of financial inclusion in the districts of Maharashtra. An inter- state and inter- district analysis shows an empirical relationship between financial inclusion and human development in India with special reference to the districts of Maharashtra sustains the interest of the paper. Sigma convergence analysis suggests that districts having lower level of financial inclusion continue to converge with the higher levels in Maharashtra.

In the context of Indian economy, the level of human development and that of financial inclusion are positively correlated in the sense that states having high level of human development are also the states with a relatively high level of financial inclusion and the nature of the association between these two development indicators is statistically significant.

REFERENCES

Barro, R.J. & Sala-i-Martin, X. (1992) Convergence, Journal of Political Economy, April,
100(2), 223-251.

CRISIL Inclusix Volume - III | June 2015 retrieved from http://www.crisil.com/pdf/corporate/CRISIL-Inclusix.pdf

Laha A, Association between Financial Inclusion and Human Development in South Asia : A Cross- Country Analysis with Special Reference to India, Journal of Economic Policy and Research, April – Sept, 2015, Vol. 10, No. 2 © 2015, Institute of Public Enterprise

Maharashtra Human Development Report 2012 retrieved from http://www.undp.org/content/dam/india/docs/human-development/MHDR%20English-2012.pdf

Sarma, M. (2008) Index of Financial Inclusion, Working Paper No. 215, Indian Council for Research on International Economic Relations.

Suryanarayana M et al, Inequality adjusted Human Development Index for India's States, 2011,UNDP retrieved from http://www.undp.org/content/dam/india/docs/inequality_adjusted_human_development_index_for_indias_state1.pdf