

# A CROSS – DIMENSIONAL ANALYSIS OF FINANCIAL INCLUSION AND DEVELOPMENT ACROSS INDIA

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**Abstract:** *The need for diverse financial products and services and their availability may leave their mark on the status of an economy. Various Studies across the globe have emphasized the significance of Financial Inclusion and its role in growth and development of the economies. India, being an Emerging Economy, is constantly striving towards promoting financial inclusion and bringing the masses under the aegis of the organized financial system through the endeavours of the Govt. of India, Reserve Bank of India, Commercial Banks and NBFC’s. Hence it is crucial to measure the extent of Financial Inclusion and its contribution towards the growth and development of Indian States and Union Territories.*

*The study assesses the position of the Financial Inclusion in India across its 28 states and 4 Union Territories for the five-year period 2010 – 14. The Index of Financial Inclusion (IFI) is constructed through the normalized Euclidean approach cited by Sarma (2008) considering the indicators of access to and usage of financial services. Principal Components Analysis technique has been used to derive the importance of the indicators in determining the index. The study attempts to examine the contribution of financial inclusion towards growth and development Indian States and Union Territories by utilizing the statistical technique, Granger – Causality. It suggests a uni-directional relationship of the country’s financial inclusion with growth and development.*

**Keywords:** *Financial Inclusion, Granger Causality, Growth and Development, Indian States and Union Territories.*

## 1. INTRODUCTION

The term ‘Financial Inclusion’ may be described as a process of bringing the weaker and vulnerable sections of the economy under the domain of an organized financial system, by creating various opportunities for access of a variety of financial services to the lower income group at an affordable cost. Making the banking services available and extending outreach through a strong network of branches are crucial in boosting growth, facilitating development, generating employment opportunities and improving infrastructure in an economy (Feldstein and Horioka, 1980; Brunetti et al., 1997; Ford and Poret, 1991; Hartog and Oosterbeek, 1993).

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In recent times, many nations across the globe have recognized the importance of an inclusive financial system. This has led the nation's financial regulators, governments and the banking industry to design and initiate a whole range of financial services. Legislative measures have been introduced in some countries, such as, in the United States, the Community Reinvestment Act (1997) entails banks to offer credit throughout their entire area of operation and prohibits them from pursuing only the rich localities. In France, the law on exclusion (1998) accentuates an individual's right to have a bank account. In the United Kingdom, the government in 2005 constituted a 'Financial Inclusion Task Force' 2005 in order to monitor the progress of financial inclusion. The German Bankers' Association introduced a voluntary code in 1996 providing for an 'everyman' current banking account that facilitates basic banking transactions.

In India, the Committees on Financial Inclusion chaired by Dr. C. Rangarajan (2008), Comprehensive Financial Services for Small Businesses and Low Income Households, headed by Nachiket Mor (2013), Financial Sector Reforms, chaired by Dr. Raghuram G. Rajan (2008) have strongly recommended that Financial Inclusion is of prime importance in India. The Banking Industry in India has taken the lead in promoting and achieving financial inclusion. The initiatives include rural branch expansion, Business Correspondents/Business Facilitators to penetrate the geographical and demographic access and usage of banking services. Others comprise, relaxation of KYC norms, Basic Savings Bank Deposit Accounts, General Credit Cards (GCC), Kisan Credit Card (KCC) Schemes, and Direct Benefit Transfer. The Pradhan Mantri Jan Dhan Yojana initiated by the Honourable Prime Minister of India, Shri Narendra Modi in August, 2014 focuses on facilitating the availability of basic savings bank account, access to need based credit, remittances facility, insurance and pension to the excluded sections (Mission of PMJDY, Department of Financial Services, Government of India, 2014).

## **2. NEED FOR THE STUDY**

India comprises 29 states and 7 union territories that is spread across 3.288 million sq. km with a culturally diverse population of 1.2 billion (WDI, 2014). The population density of India was 435.7 people per sq. km of land area in 2014 and its poverty headcount ratio at national poverty lines was 21.9% of the population in 2011 (WDI, 2014).

The overview of the socio-demographic factors of the states/union territories of India are given in Table 1. It can be observed that there is no uniformity in the distribution of the socio-demographic factors leading to an inequality and disparity among the states and union territories.

**Table 1**  
**Overview of the socio-demographic States/ Union Territories of India**

<i>States</i>	<i>Poverty</i>	<i>Rural Population</i>	<i>Unemployment</i>	<i>Literacy</i>	<i>Area (sq. km)</i>	<i>Population</i>	<i>Per Capita NSDP at Constant Prices 2004-05 (million)</i>
Andhra Pradesh	0.08	0.90	0.02	0.84	275045	84580777	42169529.69
Arunachal Pradesh	0.10	0.73	0.08	0.69	83743	1383727	36018515.89
Assam	0.08	0.63	0.05	0.77	78438	31205576	23392000.00
Bihar	0.15	0.75	0.03	0.67	94163	104099452	15506408.23
Chattisgarh	0.22	0.03	0.03	0.86	135192	25545198	28372626.42
Goa	0.32	0.86	0.03	0.73	3702	1458545	137400773.90
Gujarat	0.37	0.68	0.03	0.80	196244	60439692	63168303.06
Haryana	0.12	0.80	0.03	0.75	44212	25351462	67260351.24
Himachal Pradesh	0.20	0.48	0.02	0.92	55673	6864602	54494453.20
Jammu & Kashmir	0.19	0.71	0.07	0.80	222236	12541302	31448000.00
Jharkhand	0.14	0.74	0.06	0.88	79716	32988134	28882000.00
Karnataka	0.34	0.89	0.06	0.64	191791	61095297	46012000.00
Kerala	0.37	0.76	0.02	0.68	38852	33406061	58961000.00
Madhya Pradesh	0.33	0.83	0.04	0.73	308252	72626809	26853399.07
Maharashtra	0.08	0.75	0.07	0.82	307713	112374333	69097000.00
Manipur	0.20	0.68	0.04	0.77	22327	2855794	24042000.00
Meghalaya	0.01	0.62	0.13	0.86	22429	2966889	37154000.00
Mizoram	0.40	0.77	0.02	0.71	21081	1097206	41094000.00
Nagaland	0.32	0.72	0.02	0.71	16579	1978502	49962962.96
Odisha	0.29	0.78	0.04	0.70	155707	41974218	24928664.55
Punjab	0.05	0.38	0.10	0.87	50362	27743338	49529000.00
Rajasthan	0.17	0.57	0.08	0.79	342239	68548437	31836066.25
Sikkim	0.17	0.55	0.02	0.83	7096	610577	83527250.70
Tamil Nadu	0.09	0.67	0.03	0.68	130060	72147030	62361453.39
Tripura	0.21	0.61	0.02	0.76	10486	3673917	47260916.94
Uttar Pradesh	0.07	0.52	0.09	0.94	240928	199812341	19232839.53
Uttarakhand	0.11	0.52	0.03	0.80	53483	10086292	59160896.57
West Bengal	0.10	0.32	0.09	0.87	88752	91276115	36293000.00
<i>Union Territories</i>							
A. & N. Islands	0.11	0.65	0.03	0.77	8249	380581	72716000.00
Chandigarh	0.10	0.02	0.04	0.86	114	1055450	82797536.95
Delhi	0.35	0.67	0.07	0.67	1483	16787941	118411000.00
Puducherry	0.11	0.70	0.06	0.80	490	1247953	94787000.00

*Note:* All indicators are for the year 2011 except Per Capita NSDP at Constant Prices that is for the year 2014.

*Source:* Census 2011, Government of India; Statistical Yearbook of India, MOSPI, 2014 and Handbook of the Statistics of Indian Economy, RBI, 2014.

The presence and reach of the financial system in India has led to its growth and development (Chakraborty, 2010; Oura, 2008). Empirical studies of the past have shown that financial systems have led to economic growth and development (Goldsmith (1969), Alan Gelb (1989), Gertler and Andrew Rose (1994), Nouriel Roubini and Xavier Sala-i-Martin (1992) and Easterly (1993)). The Indian Banking System has attempted to bridge the inequality gap between the organized and unorganized, urban and rural, literate and illiterate, fortunate and marginalized sections of the society to facilitate a balanced growth and development in the economy of the states/union territories (Purohit, 2012; Shimizu, 2010; Roland, 2007). The study attempts to analyze the impact of Financial Inclusion across the Indian states/union territories on their growth and development by increasing access to financial services and promoting their usage.

### **Objectives of the Study**

The objectives formulated for the study are:

1. To assess and measure the position of Financial Inclusion of Indian states and Union Territories.
2. To establish the linkage of financial inclusion with growth and development.
3. To identify the socio-economic and geographic variables that influence financial inclusion.

### **3. LITERATURE REVIEW**

Review of literature signifies that financial inclusion is gaining momentum worldwide and the studies conducted contribute to the growing literature on the topic. Beck, Kunt and Peria (2007) discovered that greater outreach is associated with financial development and economic activity. They also found that better communication, transport infrastructure and better governance are also related to greater outreach. Government ownership of financial institutions has resulted in lower access. Nations with higher branch and ATM penetration and higher use of loan services report lower financing obstacles have ensured higher banking outreach.

Sarma and Pais (2008), conducted a cross country analysis to explore the nexus between financial inclusion and development through an index of financial inclusion described in Sarma (2008). It was noted that levels of human development and financial inclusion in a country were closely related though a few exceptions were present. Amid the socio-economic factors, income depicted a positive association with the level of financial inclusion than other factors like inequality, literacy and urbanisation. Additionally, physical infrastructure for connectivity and information were also found to be significantly associated with financial inclusion.

Amidžić, Massara, and Mialou (2014) constructed a composite index taking into account two dimensions – outreach and use of financial services to measure financial inclusion of countries using factor analysis for the period 2009 – 12. The countries with highest ranks of financial inclusion tended to belong to the high and upper-middle income groups during the study period.

Financial inclusion is gaining momentum in India due to the policies and initiatives of the Government of India and RBI, plans and schemes of the Commercial Banks. Saibal Ghosh (2011) investigated whether economic growth is affected by financial inclusion on 14 Major states of Indian from the period of 1973-2004. Findings revealed that improvements in financial outreach led to a noticeable rise in per capita growth. In terms of magnitudes, a 10 percent growth in demographic outreach raised the state per capita growth by 0.3 percent. In the case of geographic outreach, the upturn is lower. The analysis supported the supposition that states tend to grow faster when they have a higher manufacturing share and quality of state-level institutions and infrastructure exert a significant bearing on growth.

Dangi (2012) disclosed that commercial banks, cooperative banks, regional rural banks and microfinance schemes have been beneficial in getting rid of financial exclusion in India. The state of Financial inclusion in India can be improved through multitude banks, competition and good governance, with diversified ownership.

Kodan and Chhikara (2013) in a theoretical and quantitative analysis of Financial Inclusion and Economic Growth in Indian States concluded that penetration ratio is a leading contributor towards financial inclusion index among the three indicators viz., penetration, access and usage, through a log linear regression model. The study further stated that an increase of 1 percent in financial inclusion led to approximately 0.142 percent increase in the human development index. It was found that the penetration, usage and access ratios were inversely related to poverty.

Chithra and Selvam (2013), analysed the determinants of financial inclusion and their variations among the Indian States. Socio-Economic factors such as Income, Literacy and Population were found to be significantly associated with the level of financial inclusion. Among the banking variables, Deposit and Credit penetration showed significant association with financial inclusion, whereas credit-deposit ratio and investment ratio showed the reverse association.

Kumar (2013) measured the status of Financial Inclusion for 29 major states and Union territories of India for the period of 1995 to 2008. The findings have revealed that usage of financial services are affected by the socio-economic status of the citizens of the states/union territories. It was also found that geographical penetration of bank branches had an explicit impact on financial inclusion of these states/union territories for the stated period.

Jesudasan and D'Souza (2015) have stated that the Index of Financial Inclusion in India is low and the extent of Financial Inclusion in India should be improved to increase economic growth through the accelerated access to and usage of financial services. The average values of the indicators of Financial Inclusion were low when compared to the average values of the world. India should keep pace with the world with respect to geographic Commercial Bank penetration, geographic ATM penetration, demographic Commercial Bank penetration, demographic ATM penetration, loan accounts per capita, loan income ratio, deposit accounts per capita and deposit income ratio.

Sharma (2016) conducted a study to examine the relationship of financial inclusion and economic growth in the Indian states and union territories for the period of 2004 – 2013. A positive association was visible among economic growth with banking penetration, access and usage of financial services in the states and union territories of India. A Bi - Directional causality was revealed between the access of financial services and economic growth, whereas the number of deposits/ loan accounts and gross domestic product showed a unidirectional causality.

Ambarthane, Singh and Venkataramani (2016) measured financial inclusion by taking into consideration not only bank related initiatives but also other financial services such as insurance, pension, financial literacy and remittances and developed an index incorporating three dimensions of demand, supply and infrastructure. The findings reveal that the poorer section of the society should be focused upon in the Indian states to promote financial inclusion.

#### **4. RESEARCH MODEL**

##### **Demand and Supply Indicators**

The study has utilized the indicators of financial inclusion recommended by Beck et al. (2007) to highlight the demand and supply indicators of financial inclusion in Indian States and Union Territories. The set of eight indicators cannot be used entirely as the data for ATM geographic and demographic penetration for the Indian states / union territories is unavailable. The amended list is detailed below:

1. Geographic branch penetration: number of bank branches per 1,000 km<sup>2</sup>
2. Demographic branch penetration: number of bank branches per 100,000 people
3. Loan accounts per capita: number of loans per 1,000 people
4. Loan-income ratio: average size of loans to per capita net state domestic product
5. Deposit accounts per capita: number of deposits per 1,000 people
6. Deposit-income ratio: average size of deposits to per capita net state domestic product

Indicators 1-2 measure the access to financial services and is the list of the supply indicators of financial inclusion. Indicators 3-6 measure the usage of financial services and is the list of the demand indicators of financial inclusion.

The dimension index,  $d_i$  for each of the 6 indicators of financial inclusion for each year during the period 2009-14 is computed using the following formula:

$$d_i = \frac{A_i - m_i}{M_i - m_i} \tag{1}$$

Where,

$A_i$  = actual value of dimension  $i$

$m_i$  = lower limit on the value of dimension  $i$

$M_i$  = upper limit on the value of dimension  $i$

The access dimension index and usage dimension index for each year is the weighted arithmetic mean of the Indicators of financial inclusion. The weights of the indicators  $w_i$  have been derived using the statistical tool of Principal Component Analysis to identify the contribution of the dimensions to the overall index.

$$D_i = \sum_{i=1}^n w_i d_i \tag{2}$$

Where,

$w_i$  = weights of the indicator

$d_i$  = dimension index for individual indicators of financial inclusion

$n$  = number of Financial Inclusion indicators

$D_i$  = Access/Usage Dimension Index

The weights derived from the Principal Components Analysis technique have been assigned as follows:

**Table 2**  
**Assignment of Weights for Indicators of Financial Inclusion**

<i>Dimensions</i>	2010	2011	2012	2013	2014
<i>Access Indicators</i>					
Number of bank branches per 1,000 km <sup>2</sup>	0.57	0.58	0.52	0.45	0.60
Number of bank branches per 100,000 people	0.43	0.42	0.48	0.55	0.40
<i>Usage Indicators</i>					
Number of loans per 1,000 people	0.25	0.23	0.21	0.24	0.17
Average size of loans to per capita net state domestic product	0.35	0.37	0.39	0.39	0.42
Number of deposits per 1,000 people	0.07	0.06	0.02	0.06	0.02
Average size of deposits to per capita net state domestic product	0.33	0.34	0.38	0.31	0.39



The Index of Financial Inclusion,  $IFI_i$  for the  $i^{\text{th}}$  state and union territory is measured by the normalized Euclidean distance of the point  $D_i$  from the ideal point  $I(1, 1)$  (Sarma, 2008). In the  $n$ -dimensional space, the point  $O = (0, 0)$  represents the point indicating the worst situation while the point  $I = (1, 1)$  represents the highest achievement for access and usage dimension. The IFI is computed for each year using the following formula:

$$IFI_i = 1 - \frac{\sqrt{(W_1 - D_1)^2 + (W_2 - D_2)^2}}{\sqrt{W_1^2 + W_2^2}} \quad (3)$$

Where,

$IFI_i$  = Index of Financial Inclusion for  $i^{\text{th}}$  state and union territory

$D_1$  = Access Dimension Index

$D_2$  = Usage Dimension Index

$W_1$  = Weight of Access Dimension Index

$W_2$  = Weight of Usage Dimension Index

The Weights derived from the Principal Components Analysis technique assigned to the Access and Usage Dimension Indices are as follows:

**Table 3**  
**Assignment of Weights for Access and Usage Dimension Indices**

Dimensions	2010	2011	2012	2013	2014
Access Dimension Index	0.46	0.46	0.45	0.49	0.46
Usage Dimension Index	0.54	0.54	0.55	0.51	0.54

### Panel Unit-root Tests

The stationary of the time series of the variables had to be tested to verify the existence of a unit-root. Panel unit-root tests were conducted to evaluate the stationary of the time series of the variables. The following null and alternate hypothesis was framed and OLS regression equation was used for the test.

$$H_0 : \alpha = 0$$

$$H_1 : \alpha \neq 0$$

$$Y_t = a_t y_{t-1} + u_t \quad (4)$$

### Pairwise Granger Causality Tests

The nexus between financial inclusion and economic growth and development was explored by employing Pairwise Granger Causality Tests. Testing the causality



between two stationary time series of the variables of financial inclusion and economic growth are based on the following equations:

$$X_t = \alpha_0 + \sum_{j=1}^k \gamma_j x_{t-j} + \sum_{j=1}^k \beta_j y_{t-j} + u_{xt} \tag{5}$$

$$Y_t = \alpha_0 + \sum_{j=1}^k \gamma_j x_{t-j} + \sum_{j=1}^k \beta_j y_{t-j} + u_{yt} \tag{6}$$

Where

$k$  is an appropriate lag order

$\gamma$  and  $\beta, j = 0, 1, \dots k$  parameters

$\alpha$  is a constant and  $u_{tj}$  is disturbance term with zero means and finite variance

The null hypothesis that  $Y_t$  does not granger cause  $X_t$  is not accepted if  $\beta_j, j > 0$  as in Equation 5, are jointly different from zero. Similarly,  $X_t$  Granger causes  $Y_t$  if  $\gamma_j > 0$ , coefficients in Equation 6 are jointly different from zero.

Four results are possible in a Granger Causality Test. First, neither variable Granger causes the other. To elaborate, independence is suggested when the set of  $X$  and  $Y$  coefficients do not reveal statistically significant in both regressions. Second, unidirectional causality from  $Y$  to  $X$ , which means  $Y$  causes  $X$  but not vice versa. Third, unidirectional causality from  $X$  to  $Y$  that means  $X$  causes  $Y$  but not vice versa. Fourth, bilateral causality between two variables, which means  $X$  and  $Y$  Granger cause each other.

### Results and Discussion

The descriptive statistics of the Indicators of Financial Inclusion given by Access and Usage are mentioned in Table 4. The Mean and Median values are not similar except for outstanding loans as % of GDP indicating that the averages are not representative for 50<sup>th</sup> Percentile of the states and union territories. The distribution is not symmetric. The dispersion between the smallest interval of maximum and minimum values is widespread.

**Table 4**  
**Descriptive Statistics of Indicators of Financial Inclusion for Indian States**

Indicators	Mean	Median	Standard Deviation	Maximum	Minimum	Quartile 1	Quartile 3
<i>Access Indicators of Financial Inclusion</i>							
No of Bank Branches per 1000 km	28.25	11.81	53.25	300.00	0.69	5.96	28.28
No of Bank Branches per 100000 people	4.13	3.33	2.67	13.96	0.42	2.67	4.61

Indicators	Mean	Median	Standard Deviation	Maximum	Minimum	Quartile 1	Quartile 3
<i>Usage Indicators of Financial Inclusion</i>							
No of Deposit Accounts per 1000 people	933.61	798.92	568.80	3314.15	223.22	549.32	1082.58
No of Loan Accounts per 1000 people	60.58	87.82	80.62	548.13	4.79	43.31	95.36
Outstanding Deposits as % of GDP	11.76	3.46	27.49	221.58	0.03	0.39	9.53
Outstanding loans as % of GDP	1.87	1.87	13.69	135.94	0.01	0.10	6.31

The descriptive statistics of the Access and Usage Index, Index of Financial Inclusion are presented in Table 5. The Mean and Median values are not similar indicating that the averages are not representative of the 50<sup>th</sup> Percentile for the states and union territories. The distribution is not symmetric. The dispersion between the smallest interval of maximum and minimum values is widespread.

**Table 5**  
**Descriptive Statistics of Dimensions Index - Access and Usage, Index of Financial Inclusion for Indian States and Union Territories**

Index	Mean	Median	Standard Deviation	Maximum	Minimum	Quartile 1	Quartile 3
Access Dimension Index	0.1719	0.1331	0.1607		0.0417	5.7779	0.1740
Usage Dimension Index	0.1360	0.1899	0.1911	0.9640	0.0032	0.0585	0.2629
Index of Financial Inclusion	0.2735	0.2914	0.1301	0.5528	0.0425	0.1883	0.4118

The Comparative Position of the Indian States and Union Territories of Access Dimension Index for the sample period 2010-14 is shown in Table 6. The set of data is led by Goa consistently in the first position during the five year period followed by Himachal Pradesh in the second position. Manipur is in the last position with a rank consistency of 32 followed by Nagaland, Maharashtra and Madhya Pradesh.

**Table 6**  
**Comparative Position of Indian States / Union Territories for Access Dimension Index**

States/Union Territories	2010	Rank	2011	Rank	2012	Rank	2013	Rank	2014	Rank
Andaman & Nicobar Islands	0.1398	10	0.1363	11	0.1618	10	0.1822	9	0.1406	13
Andhra Pradesh	0.1075	21	0.1087	21	0.1255	19	0.1482	18	0.1258	22
Arunachal Pradesh	0.1199	16	0.1167	18	0.1356	17	0.1708	12	0.1249	23
Assam	0.0829	27	0.0817	27	0.0860	27	0.0954	28	0.0827	28

<i>States/Union Territories</i>	<i>2010</i>	<i>Rank</i>	<i>2011</i>	<i>Rank</i>	<i>2012</i>	<i>Rank</i>	<i>2013</i>	<i>Rank</i>	<i>2014</i>	<i>Rank</i>
Bihar	0.1198	17	0.1203	16	0.1254	20	0.1383	20	0.1380	16
Chandigarh	0.2614	3	0.2045	4	0.1655	9	0.1609	16	0.2021	5
Chhattisgarh	0.0758	28	0.0768	28	0.0845	28	0.1033	27	0.0842	27
Delhi	0.0886	24	0.0940	24	0.1065	24	0.1063	26	0.1580	11
Goa	0.3945	1	0.3910	1	0.4322	1	0.4969	1	0.4262	1
Gujarat	0.0864	25	0.0867	25	0.0979	25	0.1176	24	0.1082	24
Haryana	0.1176	18	0.1229	15	0.1454	12	0.1794	10	0.1823	9
Haryana	0.2192	4	0.2324	3	0.2448	3	0.2580	4	0.2411	3
Himachal Pradesh	0.2999	2	0.3018	2	0.3477	2	0.4068	2	0.3248	2
Jammu & Kashmir	0.1134	19	0.1149	19	0.1369	15	0.1679	14	0.1384	15
Jharkhand	0.1016	23	0.1017	23	0.1115	23	0.1232	23	0.1048	25
Karnataka	0.1223	15	0.1237	14	0.1452	13	0.1696	13	0.1511	12
Kerala	0.1709	7	0.1716	8	0.1831	8	0.1968	8	0.1834	8
Madhya Pradesh	0.0754	29	0.0743	29	0.0806	29	0.0908	30	0.0766	30
Maharashtra	0.0708	30	0.0708	30	0.0761	30	0.0854	31	0.0775	29
Manipur	0.0417	32	0.0427	32	0.0524	32	0.0544	32	0.0437	32
Meghalaya	0.1379	11	0.1381	10	0.1525	11	0.1710	11	0.1299	21
Mizoram	0.1705	8	0.1780	6	0.1965	6	0.2372	6	0.1764	10
Nagaland	0.0645	31	0.0661	31	0.0748	31	0.0925	29	0.0694	31
Odisha	0.1283	12	0.1279	12	0.1410	14	0.1585	17	0.1346	17
Punjab	0.1575	9	0.1643	9	0.1835	7	0.2219	7	0.2304	4
Rajasthan	0.0848	26	0.0829	26	0.0928	26	0.1086	25	0.0913	26
Sikkim	0.1714	6	0.1834	5	0.2234	4	0.2586	3	0.1914	7
Tamil Nadu	0.1092	20	0.1119	20	0.1240	21	0.1434	19	0.1335	18
Tripura	0.1225	14	0.1201	17	0.1364	16	0.1640	15	0.1392	14
Uttar Pradesh	0.1057	22	0.1070	22	0.1177	22	0.1302	22	0.1331	19
Uttarakhand	0.1736	5	0.1744	7	0.2042	5	0.2399	5	0.1953	6
West Bengal	0.1250	13	0.1254	13	0.1306	18	0.1370	21	0.1310	20

The Comparative Position of the Indian States and Union Territories of Usage Dimension Index for the sample period 2010-14 is given in Table 7. The pack of states and union territories is led by Maharashtra consistently in the first position during the five-year period followed by Uttar Pradesh in the second position. Manipur is in the last position with a rank constancy of 32 followed by Nagaland and Arunachal Pradesh.

**Table 7**  
**Comparative Position of Indian States / Union Territories**  
**for Usage Dimension Index**

<i>States / Union Territories</i>	<i>2010</i>	<i>Rank</i>	<i>2011</i>	<i>Rank</i>	<i>2012</i>	<i>Rank</i>	<i>2013</i>	<i>Rank</i>	<i>2014</i>	<i>Rank</i>
Andaman & Nicobar Islands	0.0625	27	0.0682	25	0.0525	26	0.0243	25	0.0347	26
Andhra Pradesh	0.3858	4	0.4462	4	0.4459	4	0.3427	4	0.4269	4
Arunachal Pradesh	0.0394	30	0.0342	29	0.0257	31	0.0095	30	0.0134	30
Assam	0.0902	24	0.0951	22	0.0945	20	0.0679	21	0.0850	20
Bihar	0.2061	12	0.2201	11	0.2373	10	0.1905	10	0.2310	9
Chandigarh	0.2926	8	0.2749	10	0.2093	12	0.3125	5	0.1067	16
Chhattisgarh	0.0770	25	0.0765	23	0.0786	21	0.0708	20	0.0761	21
Delhi	0.3851	5	0.3492	6	0.3654	6	0.4169	3	0.2736	8
Goa	0.2199	11	0.2021	12	0.1323	17	0.0969	18	0.0995	18
Gujarat	0.1759	15	0.1808	17	0.1849	14	0.1736	12	0.1862	13
Haryana	0.1230	18	0.1402	18	0.1167	18	0.1007	17	0.1058	17
Haryana	0.2996	7	0.3020	7	0.3070	8	0.2505	9	0.2993	7
Himachal Pradesh	0.1014	20	0.1055	19	0.0700	23	0.0417	24	0.0521	24
Jammu & Kashmir	0.0927	23	0.0689	24	0.0648	24	0.0526	22	0.0657	22
Jharkhand	0.1022	19	0.0970	20	0.0979	19	0.0730	19	0.0900	19
Karnataka	0.3780	6	0.3886	5	0.3766	5	0.2932	8	0.3511	5
Kerala	0.2898	9	0.2921	9	0.2593	9	0.1435	15	0.2281	10
Madhya Pradesh	0.1884	13	0.1918	13	0.2095	11	0.1815	11	0.2088	11
Maharashtra	0.9640	1	0.9575	1	0.9606	1	0.8083	1	0.8972	1
Manipur	0.0182	32	0.0123	32	0.0099	32	0.0032	32	0.0033	32
Meghalaya	0.0439	29	0.0338	30	0.0276	29	0.0122	28	0.0180	29
Mizoram	0.0515	28	0.0464	28	0.0405	27	0.0095	29	0.0291	27
Nagaland	0.0384	31	0.0321	31	0.0261	30	0.0045	31	0.0118	31
Odisha	0.1681	17	0.1816	16	0.1720	15	0.1240	16	0.1620	14
Punjab	0.1798	14	0.1847	15	0.1654	16	0.1512	14	0.1578	15
Rajasthan	0.1730	16	0.1911	14	0.1935	13	0.1697	13	0.1920	12
Sikkim	0.0744	26	0.0507	27	0.0336	28	0.0201	26	0.0186	28
Tamil Nadu	0.4382	3	0.4811	3	0.4725	3	0.2979	7	0.4460	3
Tripura	0.0931	22	0.0681	26	0.0598	25	0.0155	27	0.0498	25
Uttar Pradesh	0.4751	2	0.5216	2	0.5848	2	0.5306	2	0.6452	2
Uttarakhand	0.1004	21	0.0955	21	0.0705	22	0.0441	23	0.0547	23
West Bengal	0.2875	10	0.3007	8	0.3380	7	0.3013	6	0.3180	6

The Comparative Position of the Indian States and Union Territories of Index of Financial Inclusion for the sample period 2010-14 is indicated by Table 8. Positions of the Index of Financial Inclusion of Indian States and Union Territories were noted to be fluctuating. Among the Top 5 Positions over any of the 5-year period were Andhra Pradesh, Chandigarh, Delhi, Goa, Karnataka, Tamil Nadu, Uttar Pradesh and West Bengal. Whereas Arunachal Pradesh, Assam, Chhattisgarh, Manipur, Meghalaya, Nagaland, Odisha and Tripura were noted to hold lowest 5 positions through any of the 5 years. The states Manipur, Nagaland and Arunachal Pradesh have to improve their Financial Inclusion since they are consistently ranked poor during the five-year period.

**Table 8**  
**Comparative Position of Indian States / Union Territories**  
**for Index of Financial Inclusion**

<i>States/Union Territories</i>	<i>2010</i>	<i>Rank</i>	<i>2011</i>	<i>Rank</i>	<i>2012</i>	<i>Rank</i>	<i>2013</i>	<i>Rank</i>	<i>2014</i>	<i>Rank</i>
Andaman & Nicobar Islands	0.1895	25	0.1933	24	0.1909	24	0.1870	25	0.1573	28
Andhra Pradesh	0.4576	7	0.4874	4	0.5204	3	0.4619	2	0.5027	3
Arunachal Pradesh	0.1468	30	0.1382	30	0.1396	30	0.1606	30	0.1201	30
Assam	0.1726	27	0.1767	27	0.1795	27	0.1621	29	0.1667	26
Bihar	0.3281	12	0.3422	12	0.3658	10	0.3282	11	0.3709	10
Chandigarh	0.5528	1	0.4810	5	0.3754	9	0.4573	3	0.2892	13
Chhattisgarh	0.1518	29	0.1522	29	0.1606	28	0.1726	26	0.1584	27
Delhi	0.4327	8	0.4182	9	0.4513	6	0.4417	5	0.4322	6
Goa	0.5394	2	0.5138	1	0.4116	8	0.4159	8	0.3772	8
Gujarat	0.2646	16	0.2696	16	0.2863	17	0.2904	13	0.2966	12
Haryana	0.2393	19	0.2628	18	0.2547	18	0.2735	18	0.2734	18
Haryana	0.2844	14	0.2839	14	0.2907	15	0.2842	15	0.2810	17
Himachal Pradesh	0.3417	10	0.3482	11	0.3094	13	0.3276	12	0.2862	14
Jammu & Kashmir	0.2023	23	0.1767	26	0.1874	25	0.2089	22	0.1922	21
Jharkhand	0.2024	22	0.1969	22	0.2053	22	0.1933	24	0.1918	22
Karnataka	0.4720	5	0.4801	6	0.5065	4	0.4530	4	0.4896	4
Kerala	0.4609	6	0.4639	7	0.4446	7	0.3364	10	0.4124	7
Madhya Pradesh	0.2654	15	0.2675	17	0.2930	14	0.2690	19	0.2858	15
Maharashtra	0.1886	26	0.1954	23	0.2186	20	0.2892	14	0.2623	19
Manipur	0.0572	32	0.0516	32	0.0563	32	0.0551	32	0.0425	32
Meghalaya	0.1661	28	0.1544	28	0.1540	29	0.1640	27	0.1294	29
Mizoram	0.1995	24	0.1986	21	0.1992	23	0.2072	23	0.1763	23

<i>States/Union Territories</i>	<i>2010</i>	<i>Rank</i>	<i>2011</i>	<i>Rank</i>	<i>2012</i>	<i>Rank</i>	<i>2013</i>	<i>Rank</i>	<i>2014</i>	<i>Rank</i>
Nagaland	0.0995	31	0.0939	31	0.0932	31	0.0907	31	0.0739	31
Odisha	0.2975	13	0.3112	13	0.3130	12	0.2806	16	0.2968	11
Punjab	0.3369	11	0.3484	10	0.3415	11	0.3667	9	0.3715	9
Rajasthan	0.2601	18	0.2758	15	0.2898	16	0.2772	17	0.2853	16
Sikkim	0.2277	20	0.2077	20	0.2064	21	0.2338	21	0.1732	25
Tamil Nadu	0.4851	4	0.5024	2	0.5284	2	0.4255	6	0.5210	1
Tripura	0.2105	21	0.1802	25	0.1812	26	0.1626	28	0.1742	24
Uttar Pradesh	0.4922	3	0.5017	3	0.5299	1	0.4904	1	0.5159	2
Uttarakhand	0.2604	17	0.2552	19	0.2418	19	0.2523	20	0.2207	20
West Bengal	0.4086	9	0.4200	8	0.4606	5	0.4202	7	0.4405	5

A comparison of the Average values of the Access, Usage and Financial Inclusion Indexes over the 5 year period is presented in Table 9. Goa leads in the category of Average Access Index followed by Himachal Pradesh and Puducherry. Maharashtra has secured the highest rank in the category of Average Usage Index followed by Uttar Pradesh and Tamil Nadu. Uttar Pradesh has been awarded the first rank for Average Index of Financial Inclusion followed by Tamil Nadu and Andhra Pradesh. States of Maharashtra, Manipur and Nagaland are lagging behind in the scores of Average Access Index. States of Arunachal Pradesh coupled with Manipur and Nagaland have secured poor ranks for Average Usage Index and Average Index of Financial Inclusion.

**Table 9**  
**Comparative Position of Indian States and Union Territories**  
**for Average Values of Access, Usage and Index of Financial Inclusion**

<i>States/Union Territories</i>	<i>Average Access Index</i>	<i>Rank</i>	<i>Average Usage Index</i>	<i>Rank</i>	<i>Average Index of Financial Inclusion</i>	<i>Rank</i>
Andaman & Nicobar Islands	0.152	10	0.048	26	0.184	25
Andhra Pradesh	0.123	21	0.410	4	0.486	3
Arunachal Pradesh	0.134	17	0.024	30	0.141	30
Assam	0.086	27	0.087	20	0.172	27
Bihar	0.128	19	0.217	10	0.347	12
Chandigarh	0.199	5	0.239	9	0.431	7
Chhattisgarh	0.085	28	0.076	21	0.159	28
Delhi	0.111	23	0.358	5	0.435	6
Goa	0.428	1	0.150	17	0.452	5

<i>States / Union Territories</i>	<i>Average Access Index</i>	<i>Rank</i>	<i>Average Usage Index</i>	<i>Rank</i>	<i>Average Index of Financial Inclusion</i>	<i>Rank</i>
Gujarat	0.099	25	0.180	13	0.282	15
Haryana	0.150	11	0.117	18	0.261	18
Himachal Pradesh	0.336	2	0.074	22	0.323	13
Jammu & Kashmir	0.134	16	0.069	24	0.194	24
Jharkhand	0.109	24	0.092	19	0.198	22
Karnataka	0.142	13	0.358	6	0.480	4
Kerala	0.181	9	0.243	8	0.424	9
Madhya Pradesh	0.080	29	0.196	11	0.276	17
Maharashtra	0.076	30	0.918	1	0.231	20
Manipur	0.047	32	0.009	32	0.053	32
Meghalaya	0.146	12	0.027	29	0.154	29
Mizoram	0.192	7	0.035	28	0.196	23
Nagaland	0.073	31	0.023	31	0.090	31
Odisha	0.138	14	0.162	15	0.300	14
Puducherry	0.221	3	0.157	16	0.364	10
Punjab	0.192	8	0.168	14	0.353	11
Rajasthan	0.092	26	0.184	12	0.278	16
Sikkim	0.206	4	0.039	27	0.210	21
Tamil Nadu	0.124	20	0.427	3	0.492	2
Tripura	0.136	15	0.057	25	0.182	26
Uttar Pradesh	0.119	22	0.551	2	0.506	1
Uttarakhand	0.197	6	0.073	23	0.246	19
West Bengal	0.130	18	0.309	7	0.430	8

The states and union territories have been grouped under three categories – High, Medium and Low for the Access and Usage Dimensions and Financial Inclusion as noted in Table 10. There is a striking observation from Table 10 that the states and union territories with high levels of Access are lacking in the Usage Dimension. To elaborate upon, Andaman and Nicobar Islands, Himachal Pradesh, Mizoram, Sikkim and Uttarakhand have high levels of Access Dimension and low levels of Usage Dimension. The reverse also holds true for states and union territories with high levels of Usage Dimension and low levels of Access Dimension. For instance, in Table 10 - Delhi, Maharashtra and Uttar Pradesh have high levels of Usage nevertheless lag behind in the Access.



**Table 10**  
**Classification of the Levels of Access, Usage and Financial Inclusion**  
**for Indian States / Union Territories**

<i>Classification</i>	<i>Low (n<sub>1</sub> = 11)</i>	<i>Medium (n<sub>2</sub> = 11)</i>	<i>High (n<sub>3</sub> = 10)</i>
<b>Access Index</b>	Assam, Chhattisgarh,	Andhra Pradesh,	Andaman & Nicobar
<b>Cut off Scores</b>	Delhi, Gujarat,	Arunachal Pradesh,	Islands, Chandigarh,
Low - 0.119	Jharkhand,	Bihar, Haryana,	Goa, Himachal Pradesh,
Medium - 0.150	Madhya Pradesh,	Jammu & Kashmir,	Kerala, Mizoram,
High - 0.428	Maharashtra, Manipur, Nagaland, Rajasthan, Uttar Pradesh.	Karnataka, Meghalaya, Odisha, Tamil Nadu, Tripura, West Bengal.	Punjab, Uttarakhand, Sikkim, Puducherry.
<b>Usage Index</b>	Andaman & Nicobar	Assam, Chhattisgarh,	Andhra Pradesh,
<b>Cut off Scores</b>	Islands,	Goa, Gujarat, Jharkhand,	Bihar, Chandigarh,
Low - 0.074	Arunachal Pradesh,	Haryana, Madhya	Delhi, Kerala,
Medium - 0.196	Himachal Pradesh,	Pradesh, Odisha,	Karnataka,
High - 0.918	Jammu & Kashmir, Meghalaya, Manipur, Mizoram, Nagaland, Sikkim, Tripura, Uttarakhand.	Puducherry, Punjab, Rajasthan	Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal.
<b>IFI</b>	Andaman & Nicobar	Bihar, Sikkim,	Andhra Pradesh,
<b>Cut off Scores</b>	Islands,	Gujarat, Haryana,	Chandigarh, Delhi, Goa,
Low - 0.198	Arunachal Pradesh,	Himachal Pradesh,	Karnataka, Puducherry,
Medium - 0.353	Assam, Chhattisgarh,	Madhya Pradesh,	Kerala, Tamil Nadu,
High - 0.506	Jammu & Kashmir, Jharkhand, Manipur, Meghalaya, Mizoram, Nagaland, Tripura.	Maharashtra, Odisha, Punjab, Rajasthan, Uttarakhand.	Uttar Pradesh, West Bengal.

The Descriptive Statistics for the Index of Financial Inclusion of Indian states and Union Territories according to low, medium and high categories of socio - economic indicators (See Table 10) is given in Table 11. The Mean and Median were noted to be similar denoting that the averages are representatives of the 50<sup>th</sup> percentile. However, Mean and Median in low category of Income, Rural Population and Poverty, medium and high category of Unemployment were found to be dissimilar. The Maximum values of the Index of Financial Inclusion were higher in the low category than the medium or high category for the socio-economic variables of Income and Literacy. For socio-economic variables of rural population and poverty the higher values for the descriptive measure Maximum were observed in the high category. It can be implied that states / union territories with high levels of income, literacy and HDI are flagged with high levels of financial inclusion whereas low levels of rural population, poverty and unemployment are accompanied with high levels of financial inclusion.

**Table 11**  
**Descriptive Statistics of Index of Financial Inclusion**  
**by Categories of Socio-Economic Indicators**

Categories	Descriptive Measures	Index of Financial Inclusion by category of					
		Income	Literacy	Rural Population	Poverty	Unemployment	HDI
Low	Mean	0.2384	0.2778	0.3609	0.2030	0.1454	0.1169
	Median	0.1979	0.2761	0.4236	0.1811	0.1424	0.1188
	Standard Deviation	0.1219	0.1258	0.1166	0.0972	0.0769	0.0337
	Minimum	0.0525	0.1411	0.1836	0.1107	0.0761	0.0795
	Maximum	0.5060	0.5060	0.4925	0.4282	0.3362	0.1975
Medium	Mean	0.3058	0.2773	0.2465	0.1281	0.1274	0.1377
	Median	0.3226	0.2607	0.2461	0.1298	0.1244	0.1364
	Standard Deviation	0.1398	0.1494	0.1355	0.0416	0.0415	0.0358
	Minimum	0.0903	0.0525	0.0525	0.0735	0.0470	0.0761
	Maximum	0.4860	0.4925	0.4860	0.1975	0.1975	0.2206
High	Mean	0.3341	0.3220	0.2645	0.1123	0.1765	0.1964
	Median	0.3226	0.3431	0.2437	0.1137	0.1443	0.1916
	Standard Deviation	0.1137	0.1138	0.1103	0.0418	0.0992	0.1147
	Minimum	0.1836	0.1817	0.1536	0.0470	0.0735	0.0470
	Maximum	0.4925	0.4516	0.5060	0.1989	0.4282	0.4282

The Descriptive Statistics for the Access Dimension Index of the Indian states and Union Territories according to low, medium and high categories of socio-economic indicators (See Table 10) are given in Table 12. The Mean and Median were representatives of the 50<sup>th</sup> percentile. The Mean and Median in low and medium categories of Poverty, Unemployment and HDI were found to be dissimilar. It can be implied that states/union territories with high levels of income, literacy and HDI are flagged with high levels of access to financial services while low levels of rural population, poverty and unemployment are accompanied with high levels of access to financial services.

**Table 12**  
**Descriptive Statistics of Access Dimension Index**  
**by Categories of Socio-Economic Indicators**

Categories	Descriptive Measures	Access Dimension Index by category of					
		Income	Literacy	Rural Population	Poverty	Unemployment	HDI
Low	Mean	0.1046	0.1115	0.1751	0.1667	0.2017	0.2142
	Median	0.1086	0.1188	0.1521	0.1501	0.0920	0.1839
	Standard Deviation	0.0291	0.0223	0.0953	0.1235	0.2571	0.1534

Categories	Descriptive Measures	Access Dimension Index by category of					
		Income	Literacy	Rural Population	Poverty	Unemployment	HDI
Medium	Minimum	0.0470	0.0795	0.0761	0.0395	0.0271	0.0730
	Maximum	0.1381	0.1381	0.4282	0.4095	0.9175	0.5515
	Mean	0.1681	0.1369	0.1269	0.2355	0.2607	0.2166
	Median	0.1459	0.1424	0.1336	0.1803	0.2170	0.1173
	Standard Deviation	0.0671	0.0504	0.0462	0.2674	0.1646	0.2680
High	Minimum	0.0735	0.0470	0.0470	0.0226	0.0094	0.0244
	Maximum	0.3362	0.2056	0.1975	0.9175	0.5515	0.9175
	Mean	0.1766	0.2032	0.1444	0.1653	0.0991	0.1339
	Median	0.1508	0.1864	0.1236	0.1268	0.0631	0.2142
	Standard Deviation	0.1006	0.1059	0.0764	0.1570	0.0770	0.1839
	Minimum	0.0761	0.0761	0.0849	0.0094	0.0226	0.1534
	Maximum	0.4282	0.4282	0.3362	0.5515	0.2426	0.0730

The Descriptive Statistics for the Usage Dimension Index of the Indian states and Union Territories according to low, medium and high categories of socio – economic indicators (See Table 10) are given in Table 13. The values of Mean and Median were not representative of the 50<sup>th</sup> percentile. It can be implied that states / union territories with high levels of income, literacy and HDI are identified with high levels of usage of financial services while low levels of rural population, poverty and unemployment are marked with high levels of usage of financial services.

**Table 13**  
**Descriptive Statistics of Usage Dimension Index**  
**by Categories of Socio-Economic Indicators**

Categories	Descriptive Measures	Usage Dimension Index by category of					
		Income	Literacy	Rural Population	Poverty	Unemployment	HDI
Low	Mean	0.1515	0.1879	0.2830	0.3349	0.2618	0.3088
	Median	0.0920	0.1615	0.2392	0.3530	0.2308	0.2777
	Standard Deviation	0.1497	0.1599	0.2446	0.1094	0.1096	0.1208
	Minimum	0.0094	0.0244	0.0354	0.1836	0.1536	0.1591
	Maximum	0.5515	0.5515	0.9175	0.4860	0.4803	0.5060
Medium	Mean	0.1615	0.1573	0.1323	0.2782	0.3569	0.2694
	Median	0.0741	0.1173	0.0730	0.2461	0.3530	0.2308
	Standard Deviation	0.1442	0.1470	0.1287	0.1341	0.1354	0.1247
	Minimum	0.0226	0.0094	0.0094	0.0903	0.0525	0.1411
	Maximum	0.4095	0.4271	0.4095	0.4925	0.5060	0.4925

Categories	Descriptive Measures	Usage Dimension Index by category of					
		Income	Literacy	Rural Population	Poverty	Unemployment	HDI
High	Mean	0.2635	0.2280	0.1509	0.2582	0.2520	0.2966
	Median	0.1687	0.1537	0.0893	0.2370	0.2017	0.3378
	Standard Deviation	0.2610	0.2637	0.1538	0.1407	0.1229	0.1495
	Minimum	0.0395	0.0354	0.0271	0.0525	0.0903	0.0525
	Maximum	0.9175	0.9175	0.5515	0.5060	0.4516	0.4516

The Descriptive Statistics for the Index of Financial Inclusion, Access and Usage Dimension Index of the Indian states and Union Territories according to Geographical Regions are given in Table 14. It is apparent from Table 14 that the Southern Region has high levels of Financial Inclusion along with high levels of usage of financial services followed by the Northern and Western Regions. For the Access Dimension Index, Western Region has scored the highest followed by the Central Region. North Eastern Region is in the bottom position owing to its least scores for the Index of Financial Inclusion, Access and Usage Dimension Indices.

**Table 14**  
**Descriptive Statistics of Index of Financial Inclusion, Access and Usage Dimension Indices by Geographic Regions**

Region Groups	Measures	IFI	Access	Usage
Northern Region	Mean	0.3248	0.1854	0.3248
	Median	0.3226	0.1615	0.3226
	Std. Deviation	0.0893	0.1772	0.0893
	Minimum	0.1935	0.0094	0.1935
	Maximum	0.4352	0.5515	0.4352
North- Eastern Region	Mean	0.1410	0.1058	0.1410
	Median	0.1536	0.0689	0.1536
	Std. Deviation	0.0520	0.1055	0.0520
	Minimum	0.0525	0.0244	0.0525
	Maximum	0.1962	0.3091	0.1962
Eastern Region	Mean	0.2780	0.1815	0.2780
	Median	0.2548	0.1210	0.2548
	Std. Deviation	0.0983	0.1645	0.0983
	Minimum	0.1836	0.0226	0.1836
	Maximum	0.4300	0.4095	0.4300

<i>Region Groups</i>	<i>Measures</i>	<i>IFI</i>	<i>Access</i>	<i>Usage</i>
Central Region	Mean	0.2968	0.2308	0.2968
	Median	0.2611	0.2114	0.2611
	Std. Deviation	0.1480	0.1485	0.1480
	Minimum	0.1591	0.0730	0.1591
	Maximum	0.5060	0.4271	0.5060
Western Region	Mean	0.3213	0.3611	0.3213
	Median	0.2815	0.1173	0.2815
	Std. Deviation	0.1156	0.4831	0.1156
	Minimum	0.2308	0.0484	0.2308
	Maximum	0.4516	0.9175	0.4516
Southern Region	Mean	0.4492	0.1888	0.4492
	Median	0.4803	0.1572	0.4803
	Std. Deviation	0.0551	0.1183	0.0551
	Minimum	0.3636	0.0395	0.3636
	Maximum	0.4925	0.3580	0.4925

One-way ANOVA test has been conducted to test for the significance of variation between the categories of financial inclusion by socio-economic variables of Income, Literacy, and Rural population, Poverty, Unemployment, HDI and Geographical Region. The results are displayed in Table 15.

**Table 15**  
**Results of One - way ANOVA for Socio-Economic Indicators and Geographical Regions with Index of Financial Inclusion and Dimension Indices of Access and Usage**

<i>Socio-Economic Variables</i>	<i>Financial Inclusion / Dimension Indices</i>	<i>F Statistic</i>	<i>Sig.</i>
Income	IFI	1.6181	0.2157
	Access	3.3383	0.0494*
	Usage	1.0991	0.3466
Literacy	IFI	0.3959	0.6766
	Access	5.1240	0.0124*
	Usage	0.3463	0.7102
Rural Population	IFI	2.7917	0.0778
	Access	1.1495	0.3308
	Usage	2.1837	0.1308
Poverty	IFI	5.7266	0.3725
	Access	1.0219	0.0080**
	Usage	0.4641	0.6333
Unemployment	IFI	2.3866	0.1098
	Access	1.1281	0.3374
	Usage	2.0474	0.1473

<i>Socio-Economic Variables</i>	<i>Financial Inclusion / Dimension Indices</i>	<i>F Statistic</i>	<i>Sig.</i>
HDI	IFI	0.2586	0.7739
	Access	3.5810	0.0407*
	Usage	0.6149	0.5475
Region	IFI	7.0592	0.0003**
	Access	0.8017	0.5587
	Usage	3.0778	0.0259*

Note: \*indicates significant at 5% level and \*\*indicates significant at 1% level

Table 15 has revealed that socio-economic variables of income, literacy, poverty and HDI are significantly related to access to financial services. There is a significant variation across geographical Region with respect to Index of Financial Inclusion and Usage of Financial Services.

A Post-Hoc test was conducted to check for the significance between various levels of socio-economic variables and various geographic regions with the Indices of Financial Inclusion. In Table 16, it is clear that the Access Dimension Index is significantly different between the low and high levels of Income and Literacy of Indian States / Union Territories. On comparing the Mean scores (See Table 12), it can be implied that Indian states / union territories with low income and literacy levels have low access to financial services as compared to those of high levels of income and literacy. A reverse significant differentiation was observed in the case of HDI of Indian States / Union Territories. States and Union Territories with low level of Human Development were found to have significantly lesser access to financial services than the states / union territories with high level of HDI (See Table 12, for mean scores). A significant difference prevailed in the access to financial services within the low and medium levels and low and high levels of Poverty in Indian States/Union Territories.

**Table 16**  
**Results of Post-Hoc Test for Socio-Economic Indicators and Geographical Regions with Index of Financial Inclusion and Dimension Indices of Access and Usage**

<i>Socio-Economic Variables</i>	<i>Financial Inclusion / Dimension Indices</i>	<i>Groups</i>		<i>Sig.</i>
Income	Access	Low	Medium	0.1055
			High	0.0471*
		Medium	Low	0.1055
			High	0.9596
		High	Low	0.0471*
			Medium	0.9596

<i>Socio-Economic Variables</i>	<i>Financial Inclusion / Dimension Indices</i>	<i>Groups</i>		<i>Sig.</i>
Education	Access	Low	Medium	0.6539
			High	0.0111*
		Medium	Low	0.6539
			High	0.0790
		High	Low	0.0111*
			Medium	0.0790
Poverty	Access	Low	Medium	0.0335*
			High	0.0107*
		Medium	Low	0.0335*
			High	0.8501
		High	Low	0.0107*
			Medium	0.8501
HDI	Access	Low	Medium	0.7688
			High	0.0379*
		Medium	Low	0.7688
			High	0.1519
		High	Low	0.0379*
			Medium	0.1519
Region	IFI	Northern	North- Eastern	0.0099**
			Eastern	0.9374
			Central	0.9962
			Western	1.0000
			Southern	0.2204
			North- Eastern	0.0099**
		North- Eastern	Northern	0.1101
			Eastern	0.1046
			Central	0.0788
			Western	0.0001
			Southern	0.9374
			North- Eastern	0.1101
		Eastern	Northern	0.9995
			Eastern	0.9838
			Central	0.0477*
			Western	0.9962
			Southern	0.1046
			North- Eastern	0.9995
		Central	Northern	0.1046
			Eastern	0.9995



<i>Socio-Economic Variables</i>	<i>Financial Inclusion / Dimension Indices</i>	<i>Groups</i>	<i>Sig.</i>
		Western	0.9992
		Southern	0.1651
	Western	Northern	1.0000
		North- Eastern	0.0788
		Eastern	0.9838
		Central	0.9992
		Southern	0.4148
	Southern	Northern	0.2204
		North- Eastern	0.0001**
		Eastern	0.0477
		Central	0.1651
		Western	0.4148
Usage	Northern	North- Eastern	0.6459
		Eastern	0.9996
		Central	0.9959
		Western	0.2995
		Southern	0.6592
	North- Eastern	Northern	0.6459
		Eastern	0.8478
		Central	0.4794
		Western	0.0281*
		Southern	0.0703
	Eastern	Northern	0.9996
		North- Eastern	0.8478
		Central	0.9738
		Western	0.2188
		Southern	0.5160
	Central	Northern	0.9959
		North- Eastern	0.4794
		Eastern	0.9738
		Western	0.6522
		Southern	0.9534
	Western	Northern	0.2995
		North- Eastern	0.0281*
		Eastern	0.2188
		Central	0.6522
		Southern	0.9635

<i>Socio-Economic Variables</i>	<i>Financial Inclusion / Dimension Indices</i>	<i>Groups</i>		<i>Sig.</i>
		Southern	Northern	0.6592
			North- Eastern	0.0703
			Eastern	0.5160
			Central	0.9534
			Western	0.9635

Note: \* indicates significant at 5% level and \*\* indicates significant at 1% level

From Table 16, it can be revealed that there is a significant difference in levels of Financial Inclusion between the Northern and North - Eastern, Eastern and Southern and Southern and North-Eastern regions. Similarly, there exists a significant differentiation in Usage of financial services between the Western and North-Eastern regions of India.

### Granger Causality Test

As the relationship between Financial Inclusion and Economic Growth and Development is sought, Granger Causality Test is conducted to explore the same. It is required for the time series of the various variables to be stationary to prevent spurious regressions and unreliable results. Panel unit root tests were undertaken to verify whether the time series of the variables is stationary. The results are displayed in Table 17.

**Table 17**  
**Results of Panel - Unit Root Tests**

<i>Variables</i>	<i>Probability</i>			
	<i>Levin, Lin &amp; Chu t*</i>	<i>Im, Pesaran and Shin W-stat</i>	<i>ADF- Fisher Chi-square</i>	<i>PP - Fisher Chi-square</i>
Index of Financial Inclusion	0.00	0.00	0.00	0.00
Access Dimension Index	0.00	0.00	0.00	0.00
Usage Dimension Index	0.00	0.00	0.00	0.00
No of Bank Branches per 1000 km	0.00	0.00	0.00	0.00
No of Bank Branches per 100000 people	0.00	0.00	0.00	0.00
No of Deposit Accounts per 1000 people	0.00	0.00	0.00	0.00
No of Loan Accounts per 1000 people	0.00	0.00	0.00	0.00
Outstanding Deposits as % of GDP	0.00	0.00	0.00	0.00
Outstanding loans as % of GDP	0.00	0.00	0.00	0.00
Per Capita Net State Domestic Product [ln(PCNSDP)]	0.00	0.00	0.00	0.00

Note: All the Probability values are significant at 0.05 level.

It can be noted from Table 17 that the variables considered to investigate the relationship between Financial Inclusion and Economic Growth and Development have a probability value less than 0.05, implying that they are significant at 5% level. It can be stated that the time series of the variables is stationary and do not possess a unit root.

Table 18 reports Lag order selection criteria with lag 3 as an appropriate lag order chosen in terms of the Akaike Information Criteria (AIC) for the full sample period.

**Table 18**  
**Lag Order Selection Criteria**

<i>Lag</i>	<i>LogL</i>	<i>LR</i>	<i>FPE</i>	<i>AIC</i>	<i>SC</i>	<i>HQ</i>
0.00	-1756.87	NA	2.91	29.45	29.68	29.54
1.00	-1564.18	350.05	0.62	27.90	30.46	28.94
2.00	-1226.32	557.47	0.01	23.94	28.82	25.92
3.00	-773.99	670.96	0.00	18.07	25.27	20.99

Pairwise Granger Causality Test was conducted to determine whether growth and development could be attributed to financial inclusion. The Granger Causality test is conducted to study the causal relationship between growth and development and Financial Inclusion.

**Table 19**  
**Results of Pairwise Granger Causality Test**

<i>Null Hypothesis</i>	<i>F-Statistic</i>	<i>Prob.</i>	<i>Relationship</i>
Growth and Development does not Granger Cause Access to Financial Services	5.31236	0.0027**	Bi - Directional
Access to Financial Services does not Granger Cause Growth and Development	8.03852	0.0001**	
Growth and Development does not Granger Cause Usage of Financial Services	1.46418	0.2339	No Relationship
Usage of Financial Services does not Granger Cause Growth and Development	0.83688	0.4792	
Growth and Development does not Granger Cause Financial Inclusion	0.84128	0.4769	Uni - Directional
Financial Inclusion does not Granger Cause Growth and Development	4.5515	0.0063**	
Geographic branch penetration does not Granger Cause Growth and Development	4.12994	0.0102*	Uni - Directional
Growth and Development does not Granger Cause Geographic branch penetration	0.8532	0.4707	
Demographic branch penetration does not Granger Cause Growth and Development	10.2244	0.00002**	Uni - Directional
Growth and Development does not Granger Cause Demographic branch penetration	2.08632	0.1121	

<i>Null Hypothesis</i>	<i>F-Statistic</i>	<i>Prob.</i>	<i>Relationship</i>
Deposit Accounts per capita does not Granger Cause Growth and Development	8.86143	0.00007**	Uni - Directional
Growth and Development does not Granger Cause Deposit Accounts per capita	1.73497	0.1701	
Loan accounts per capita does not Granger Cause Growth and Development	1.20495	0.3162	Uni - Directional
Growth and Development does not Granger Cause Loan accounts per capita	13.301	0.000001**	
Deposit - income ratio does not Granger Cause Growth and Development	0.7849	0.5073	No Relationship
Growth and Development does not Granger Cause Deposit - income ratio	0.06208	0.9796	
Loan - income ratio does not Granger Cause Growth and Development	0.46341	0.7089	No Relationship
Growth and Development does not Granger Cause Loan - income ratio	0.94317	0.4259	

Note: \* indicates significant at 5% level and \*\* indicates significant at 1% level

The derived F-values suggests that there is a unidirectional causality between financial inclusion, geographic branch penetration, demographic branch penetration, deposit accounts per capita, and loan accounts per capita with growth and development. This implies that growth and development of Indian states/union territories is influenced by financial inclusion, geographic branch penetration, demographic branch penetration, deposit accounts per capita, and loan accounts per capita. It is also found from Table 19 that there is a bidirectional relationship between access to financial services and growth and development. Therefore, the study suggests that access to financial services is influencing the Growth and development of states/ union territories of India and growth and development also impacts access to financial services. Again it is observed from the Table 19 that there is no apparent causality between usage of financial services, deposit - income ratio and loan - income ratio with growth and development of Indian states/ union territories. However, the study found out that the predictive power of forecasting financial services, deposit - income ratio and loan - income ratio in the growth and development of Indian states/union territories and vice versa is negligible.

## 5. CONCLUSION

The study has measured the status of Financial Inclusion for the Indian states/ union territories for the five-year period 2009 - 14. Goa has led in the category of Access dimension followed by Himachal Pradesh and Puducherry. Maharashtra has secured the highest rank in the category of Usage dimension followed by Uttar Pradesh and Tamil Nadu. Uttar Pradesh has been awarded the first rank

for Financial Inclusion followed by Tamil Nadu and Andhra Pradesh. States of Maharashtra, Manipur and Nagaland are lagging behind in the scores of Access Dimensions. States of Arunachal Pradesh coupled with Manipur and Nagaland have secured poor ranks for Usage and Financial Inclusion. The Study reveals that the Northern and North – Eastern, Eastern and Southern and Southern and North-Eastern regions show significant differences in their levels of Financial Inclusion. Likewise, between the Western and North-Eastern regions of India there level of financial services usage differed significantly.

The study has attempted to establish the linkage between financial inclusion and growth and development. Financial Inclusion revealed an influence on Growth and Development of the country through a uni-directional relationship. The indicators of access such as geographic branch penetration, demographic branch penetration and the absorption of these services by population depicted through deposit accounts per capita, and loan accounts per capita have significantly bared an influence on the Country's overall growth and development. The endeavours of the financial governance of India to facilitate access of financial services has significantly influenced the Growth and Development during 2010-14, the same is seen true vice versa. This represents the realization of efforts of the India's Financial System to uplift growth and development of the Country.

### References

- Ambarkhane, D., Singh, A., & Venkataramani, B. (2016). *International Journal of Rural Management*, 12 (1), 72 – 100.
- Amidžić, G., Massara, A., & Mialou, A. (2014). Assessing Countries' Financial Inclusion Standing – A New Composite Index. *International Monetary Fund, Working Paper(14/36)*, 1 - 31.
- Beck, T. A., Demirguc-Kunt, & Levine, R. (2007). Reaching out: Access to and use banking services across countries. *Journal of Financial Economics*, 85, , 234 - 66.
- Brunetti, A., Kisunko, G., & Weder, B. (1998). Credibility of rules and economic growth: Evidence from a worldwide survey of the private sector. *The World Bank Economic Review*, 12(3), 353 - 84.
- Chakraborty, I. (2010). Financial development and economic growth in India: An analysis of the post reform period. . *South Asia Economic Journal*, 11, 27.
- Chithra, N., & Selvam, M. (2013, July 19). Determinants of Financial Inclusion: An Empirical Study on the Inter-State Variations in India. Retrieved from <http://ssrn.com/abstract=2296096>.
- Dangi, V. (2012). Financial Inclusion: A Saga of Indian Financial System. *Asia-Pacific Journal of Management Research and Innovation*, 8 (2), 111 - 125.
- Department of Financial Services;. (2014). (Ministry of Finance) Retrieved from Pradhan Mantri Jan Dhan Yojana: <http://www.pmjdy.gov.in/>
- Easterly, W., Kremer, M., Pritchett, L., & Summers, L. H. (1993). Good policy or good luck?: Country growth performance and temporary shocks. *Journal of Monetary Economics*, 32.
- Feldstein, M., & Horioka, C. (1980). Domestic saving and international capital flows. *Economic Journal*, 90, 314-329.

- Ford, R., & Poret, P. (1991). Infrastructure and private-sector productivity. *Economic Studies*, 17, 63-89.
- Gelb, A. (1989, June). Financial Policies, Growth, and Efficiency. *World Bank PPR Working Paper* (202).
- Gertler, M., & Rose, A. (1994). Finance, Public Policy and Growth. In J. A. Hanson, G. Caprio, & I. Atiyas (Eds.), *Financial Reform: Theory and Experience* (pp. 13-48). New York: Cambridge University Press.
- Ghosh, S. (2011). Does financial outreach engender economic growth? Evidence from Indian States. *Journal of Indian Business Research*, 3(2), 74-97. doi:10.1108/17554191111132206.
- Goldsmith, R. W. (n.d.). *Financial Structure and Development*. New Haven, CT: Yale University Press.
- Government of India. (2016, March 23). Retrieved from Census India: <http://censusindia.gov.in/>
- Hartog, J. and Oosterbeek (1993). Public and private sector wages in the Netherlands. *European Economic Review*, 37, 97 - 114.
- Jesudasan, S., & D'Souza, R. (2015, June). Leveraging financial inclusion for economic growth in india. *ZENITH International Journal of Business Economics & Management Research*, 5(6), 120-134.
- Kodan, A. S., & Chhikara, K. S. (2013). A Theoretical and Quantitative Analysis of Financial Inclusion and Economic Growth. *Management and Labour Studies*, 38(1&2), 103-134. doi:10.1177/0258042X13498009.
- HYPERLINK "<http://www.emeraldinsight.com/author/Kumar%2C+Nitin>" Kumar, N. (2013). Financial inclusion and its determinants: evidence from India. *Journal of Financial Economic Policy*, 5 (1), 4 - 19.
- Ministry of Statistics and Programme Implementation. (n.d.). Retrieved from Statistical Year Book, India 2015: [http://mospi.nic.in/mospi\\_new/upload/SYB2015/index1.html](http://mospi.nic.in/mospi_new/upload/SYB2015/index1.html).
- Nachiket Mor. (2013). *Committee on Comprehensive Financial Services Businesses and Low Income Households*. RBI.
- Ouro, H. (2008, March). Financial Development and Growth in India: A Growing Tiger in a Cage? (L. Yee, Ed.) *IMF Working Paper, WP/08/79*, 1-32.
- Purohit, J. J. (2012). *A critical analysis of financial reforms in banking sector in post liberalization period: with respect to public and private sector banks*. Mohan Lal Sukhadia University, Banking and Business Economics. Retrieved from <http://hdl.handle.net/10603/3712>.
- Rajan, R. (2008). *Report On The Committee On Financial Sector Reforms*. New Delhi: RBI.
- Rangarajan ;. (2008). *Report of the Committee on Financial Inclusion*. RBI. Committee Report.
- RBI. (2014). *Handbook of the Statistics of Indian Economy*.
- Roland, C. (2007). *Chinese Banking Sector, Banking Sector Liberalisation in India.: Evaluation of Reforms and Comparative Perspective on China*, Physica Verlag HD: Springer Link.
- Roubini, N., & Sala-i-Martin, X. (1992). Financial repression and economic growth. (M. Rosenzweig, Ed.) *Journal of Development Economics*, 39(1), 5-30.
- Sarma, M. (2008, June). Index of Financial Inclusion. *INDIAN COUNCIL FOR RESEARCH ON INTERNATIONAL ECONOMIC RELATIONS, Workin Paper(215)*, 1 - 20.

- Sarma, M., & Pais, J. (2008). Financial Inclusion and Development: A Cross Country Analysis. *Indian Council for Research on International Economic Relations*, 1 - 28.
- Sharma, D. (2016). Nexus between financial inclusion and economic growth: Evidence from the emerging Indian economy. *Journal of Financial Economic Policy*, 8 (1), 13 - 36.
- Shimizu, S. (2010). The State of the Indian Banking Sector and its Role in India's High Growth. *10(36)*.
- Shri Raghuram G. Rajan. (2009). *A Hundred Small Steps Report of the Committee on Financial Sector Reforms*. Planning Commission, Government of India. Sage Publications.
- World Bank. (2014). World Development Indicators.



