

# Financial Inclusion and its Determinants: The Case of Goa

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## Abstract

The aim of the paper is to examine the extent of financial inclusion in Goa through an in- depth analysis of the access and usage of banking services across the talukas in Goa for the period from 1994-95 to 2014-15. The study is based on the data collected from the Directorate of Planning, Statistics and Evaluation, Government of Goa. By using an Index of Financial Inclusion, the study classifies all talukas in Goa into high, medium and low categories, with respect to financial inclusion. In order to understand the factors affecting financial inclusion, a multiple regression model is developed and estimated following the method of ordinary least squares. The results show that the spread of the commercial banking network is not evenly distributed across talukas in Goa. It is observed from the study that although there has been an improvement in outreach activity in the banking sector, the achievement is not significant. The findings also indicate that regions characterized by low levels of education, lower degree of urbanization and lower levels of tourist arrivals seem to be less financially inclusive. In other words, regions that are less developed are also less financially inclusive. The results of the regression analysis show that the three independent variables, namely, urbanization, school enrolment and tourist arrivals, are found to have a positive impact on financial inclusion and are statistically significant. The findings of this study have policy implications for initiating measures that would enhance the levels of financial inclusion in all regions, especially the less developed ones.

**Keywords:** Financial Inclusion, Index of Financial Inclusion, Access Dimension, Usage Dimension

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## Introduction

After liberation in 1961, the state of Goa has been brought into the mainstream of national economic development. Within a span of five decades, Goa has made significant progress in both economic and social fields. The benefits of development are, however, not evenly distributed over the entire state. The state of Goa is divided into two districts, namely, North Goa (comprising of the six

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talukas of Tiswadi, Bardez, Pernem, Bicholim, Sattari and Ponda) and South Goa (comprising of the five talukas of Sanguem, Canacona, Quepem, Salcete and Mormugao).

Goa has an excellent network of banks and banking facilities. Goa has a presence of almost all public sector and new generation commercial and private sector banks. The State Bank of India with a network of 52 branches in North Goa District and 28 branches in South Goa District is the Lead Bank in the state. Over the years, there has been a phenomenal growth of banking facilities in Goa. There is a scheduled commercial bank for every 3014 people in Goa, as against the all-India average of 9963 people (RBI 2015). The State Level Bankers' Committee (SLBC) had identified both districts of Goa for 100% financial inclusion. It has been claimed that all banks in North Goa and South Goa districts have already achieved 100% financial inclusion by the end of March 2008 (NABARD 2011a; 2011b).

Financial inclusion is defined, for the purpose of this study, as the process that ensures the ease of access and usage of the formal financial system for all members of an economy. This definition emphasizes two dimensions of financial inclusion, namely, access and usage of the financial system. Further, banking inclusion is considered as analogous to financial inclusion. This study refers exclusively to commercial and cooperative banks functioning in the state of Goa for the simple reason that the banking sector intermediates most of the funds in the economy.

In the present study, an attempt is made to examine the extent of financial inclusion across the talukas in Goa for the period from 1994-95 to 2014-15. Specifically, the study aims at (i) analyzing the trends in the access to and usage of banking services across the talukas in Goa; (ii) measuring the degree of financial inclusion by using a composite index of financial inclusion; and (iii) identifying the factors affecting financial inclusion.

To begin with, it describes the Index of Financial Inclusion (IFI). The next section provides an overview of the access and usage of banking services in Goa. This is followed by an analysis of the degree of financial inclusion across the talukas in Goa and the factors determining financial inclusion. The final section concludes the paper.

## **Theoretical and Methodological Framework**

Several indicators have been used to measure the extent of financial inclusion. Earlier studies on financial inclusion have used individual indicators separately to assess the extent of financial inclusion. Beck *et al.*, (2007) use several indicators of banking sector outreach such as geographic and demographic branch penetration, loan and deposit accounts per capita, and loan-income and deposit-income ratios. Some of the most common indicators used in earlier studies have been the number of bank accounts (per 1000 persons), the number of bank branches (per million people), the number of ATMs (per million people), amount of bank credit and amount of bank deposit. These indicators no doubt provide important and useful information on the outreach of the financial system of an economy. However, the process of financial inclusion / exclusion is multidimensional. Thus, if these indicators are used individually, it can lead to a wrong understanding of the extent of financial inclusion in an economy.

This study is restricted to two dimensions of financial inclusion largely due to non-availability of relevant and consistent taluka-wise data so as to compute comparable IFI. It must be noted that access to banking services is not synonymous with the use of banking services. Individuals and households who enjoy access to banking services might decide not to use them, due to socio-cultural reasons or high opportunity costs. Access refers to the possibility to use banking services and usage refers to the actual use of financial services.

The access to banking services is measured in terms of two indicators, namely, geographic branch penetration (i.e., bank branches per 100 sq. km.) and demographic branch penetration (i.e., bank branches per 10000 people), basically reflecting the availability of banking services. The indicator of branches per square kilometer helps characterize the geographic penetration of banks and can be interpreted as a proxy for the average distance of a potential customer from the nearest bank branch. Higher geographic penetration would indicate lesser distance and easier geographic access. The per capita measure of branches is used to characterize the demographic penetration of banks and can be interpreted as a proxy for the average number of people served by each bank branch. Higher demographic penetration would indicate fewer customers per branch and hence easier access. Higher branch intensity in demographic and geographic terms implies greater access to the use of banking services by households. The use of banking services is measured in terms of total deposits mobilized and total credit advanced. A larger amount of deposits and credit is interpreted as greater usage of banking services by households.

Sarma (2008) constructed a multidimensional index of financial inclusion (IFI) across countries by considering three dimensions of financial inclusion, namely, accessibility, availability and usage of banking services. Researchers have measured the extent of financial inclusion in India in terms of the IFI by using a multi-dimensional approach similar to that used by Sarma (Kumar and Mishra 2011; Kumar 2011; Chattopadhyay 2011; Singh and Kodan 2011). In the present study, the IFI has been constructed largely following the methodology used by Sarma (2008, 2010, 2012). The index has been modified so as to suit the taluka-level analysis of financial inclusion.

The IFI is computed by first calculating a dimension index for each dimension of financial inclusion. The dimension index for the  $i^{\text{th}}$  dimension in taluka  $k$ ,  $d_{ik}$  is computed by the following formula:

$$d_{ik} = w_{di} \frac{A_{ik} - l_i}{M_i - l_i} \dots\dots\dots (1)$$

where

$w_{di}$  = Weight given to dimension  $i$ ,  $0 \leq w_{di} \leq 1$

$A_{ik}$  = Actual value of dimension  $i$  in taluka  $k$

$l_i$  = Minimum value of dimension  $i$  (empirically observed lowest value)

$M_i$  = Maximum value of dimension  $i$  (empirically observed highest value)

In computing this index, the empirically observed maximum and minimum values are considered for each dimension. Since the IFI is calculated for different talukas within the same state, there is only a remote possibility of the empirically observed highest value being an outlier. It may be noted that these empirically observed upper and lower bounds are different for different years. The IFI measures the extent of financial inclusion in a particular taluka relative to the prevailing situation in all talukas.

Following Sarma (2012), if n dimensions of financial inclusion are considered, a region's achievements in these dimensions will be represented by a point  $Y = (d_1, d_2, d_3, \dots, d_n)$  in the n- dimensional Cartesian space. Point  $O = (0, 0, 0, \dots, 0)$  will represent the worst situation and point  $W = (wd_1, wd_2, \dots, wd_n)$  will represent the ideal situation. In order to compute the IFI,  $Y_1$  (distance between Y and O) and  $Y_2$  (inverse distance between Y and W) are computed. The final IFI is computed by taking a simple average of  $Y_1$  and  $Y_2$ .

The formulae are as follows:

$$Y_1 = \frac{\sqrt{\sum_{i=1}^n d_i^2}}{\sqrt{\sum_{i=1}^n w_{di}^2}} \dots\dots\dots (2)$$

$$Y_2 = 1 - \frac{\sqrt{\sum_{i=1}^n (w_{di} - d_i)^2}}{\sqrt{\sum_{i=1}^n w_{di}^2}} \dots\dots\dots (3)$$

$$IFI = \frac{1}{2} (Y_1 + Y_2) \dots\dots\dots (4)$$

In the present index, a weight of 0.6 has been provided for the index of accessibility and 0.4 for the index of usage. Given these weights, we can represent a taluka k by a point  $(a_k, u_k)$  in the two dimensional space, such that  $0 \leq a_k \leq 0.6$  and  $0 \leq u_k \leq 0.4$ , where  $a_k$  and  $u_k$  are the access and usage dimension indexes respectively for taluka k computed using formula (1). In the two dimensional space, the point (0, 0) will indicate the worst situation (complete financial exclusion) and the point (0.6, 0.4) will indicate the best or ideal situation (complete financial inclusion).

The  $IFI_k$  for taluka k is measured as follows:

$$IFI_k = 1/2 \left[ \frac{\sqrt{a_k^2 + u_k^2}}{\sqrt{(0.6)^2 + (0.4)^2}} \right] + \left[ 1 - \frac{\sqrt{(0.6 - a_k)^2 + (0.4 - u_k)^2}}{\sqrt{(0.6)^2 + (0.4)^2}} \right] \dots\dots\dots (5)$$

The IFI used in the present study has certain limitations. Firstly, it does not consider all dimensions of financial inclusion. It includes only the accessibility and usage dimensions but does not take into account dimensions such as the cost and ease of transactions. There is no doubt that a multi-dimensional approach would lead to a more robust IFI. However, the present study had to restrict itself to only two dimensions mainly due to non-availability of taluka-wise data on other dimensions of financial inclusion. Secondly, the IFI suffers from lack of taluka-specific information due to the aggregative nature of the data. For instance, geographical aspects of financial inclusion such as the rural-urban divide and gender related aspects are not covered in the study. Thirdly, the IFI does not distinguish between resident and non-resident bank accounts. As a result of this, certain talukas such as Salcete and Bardez may show high levels of financial inclusion on account of a large number of non-resident banking activities. Finally, though both dimensions are considered equally important for measuring financial inclusion, relatively less weight (i.e. weight less than one) is given to the dimensions

due to lack of adequate data on important indicators that completely characterize these dimensions. As far as accessibility of banking services is concerned, the importance of bank branches has come down, particularly in the urban areas, on account of the introduction of internet banking and provision of banking services through telephones. Similarly, data on credit and deposit do not completely depict the usage of the financial system, as other services of the banking system, such as payments, remittances and transfers are not included in the analysis.

## Access to and Usage of Banking Services in Goa

The state of Goa has witnessed tremendous progress in banking since liberation. The number of banking branches in Goa steadily increased from five in 1962, just after liberation, to 300 bank branches in 1988 after it gained Statehood and further to 799 bank branches in 2015. The aggregate deposits registered an increase from Rs. 9 crore in 1962 to Rs.55611.52 crore in 2014-15. The gross credit also registered a rise from Rs. 3 crore in 1962 to Rs.17469.66 crore by 2014-15. As a result of this, the credit deposit ratio in 2014-15 was 31% (GOG 2015).

The spread of the commercial banking network is not evenly distributed across talukas. Table 1 shows the distribution of bank branches across talukas in Goa for the period from 1994-95 to 2014-15. It can be observed that about 60 per cent of the banking offices are located in North Goa District. For the same period, approximately 81 per cent of the bank branches are located in the talukas of Bardez, Salcete, Tiswadi, Mormugao and Ponda. These five talukas are the relatively more economically developed talukas of Goa. On the other hand, the talukas of Sattari, Pernem, Sanguem and Canacona account for only about 11 per cent of the bank branches in Goa. In 2014-15, the maximum number of branches were located in Bardez (163) which constituted 20 per cent of the total number of branches. At the other extreme, the least number of branches was located in Sattari (17) which constituted 2.13 per cent of the total number of branches in the state. Thus, it can be seen that the bank branches have not been evenly distributed across the state. Further, even in those talukas which have a large number of bank branches, there are a number of villages where there are no banks at all.

**Table 1:** Taluka-wise Number of Bank Branches in Goa

Year Taluka	1994-95	2000-01	2005-06	2009-10	2014-15
Tiswadi	66	87	94	102	149
Bardez	70	92	102	118	163
Pernem	10	15	15	17	31
Bicholim	19	20	21	23	35
Sattari	7	11	11	11	17
Ponda	32	41	44	57	82
<b>North Goa District</b>	<b>204</b>	<b>266</b>	<b>287</b>	<b>328</b>	<b>477</b>
Sanguem	15	15	15	17	23
Canacona	9	11	12	15	21
Quepem	12	15	16	17	26
Salcete	70	93	100	121	181
Mormugao	32	44	46	49	71
<b>South Goa District</b>	<b>138</b>	<b>178</b>	<b>189</b>	<b>219</b>	<b>322</b>
<b>Goa State</b>	<b>342</b>	<b>444</b>	<b>476</b>	<b>547</b>	<b>799</b>

Source: Reports on Credit-Deposit Ratio in Goa 1994-95 to 2014-15, Directorate of Planning, Statistics and Evaluation, Government of Goa

The growth in banking facilities has not been uniform across the state. Over the same period, the highest growth has been witnessed in Pernem (210 per cent) followed by Salcete (158.57 per cent) Ponda (156.25 per cent) and Sattari (142.86 per cent). The least growth is observed in Sanguem (53.33 per cent) followed by Bicholim (84.21 per cent). All the other talukas have recorded growth between 116 to 133 per cent.

The access to banking services is measured in terms of geographic and demographic penetration. As far as geographic penetration (GP) is concerned, the highest ranking talukas have been Tiswadi, Mormugao, Bardez and Salcete and the lowest ranking talukas have been Sanguem, Sattari and Canacona over the period from 1994-95 to 2014-15. As far as demographic penetration (DP) is concerned, the highest ranking talukas have been Tiswadi, Mormugao, Bardez and Salcete and the lowest ranking talukas have been Sattari, Pernem and Quepem over the same period. The highest ranking talukas remain the same for geographic penetration. However, as far as demographic penetration is concerned, it is observed that Ponda emerged as the fourth highest ranking taluka and Mormugao slipped to the fifth position in 2014-15. Sattari taluka remained the lowest ranking taluka for demographic penetration. In 2014-15, Sanguem was the lowest ranking taluka for geographic penetration. The usage of banking services is measured in terms of total deposits mobilized (TD) and total credit advanced (TC). There has been a growth in deposits and credit across the state during the period under study. However, deposits have been larger and have been growing at a faster rate than credit. As a result, the credit-deposit ratio has been low. The low credit-deposit ratio in the state is due to low credit off-take in the state and high level of deposits with banks on account of huge inflow of foreign remittances.

During the period from 1994-95 to 2014-15, the talukas of Salcete, Tiswadi Bardez and Mormugao accounted for around 86.56 per cent of the total deposits mobilized in the state. At the other end, the aggregate deposits mobilized in the six talukas of Sattari, Canacona, Quepem, Sanguem, Pernem and Bicholim accounted for about 8 per cent of the total deposits. As far as credits are concerned, approximately 86 per cent of the credits were accounted are from the talukas of Tiswadi, Salcete, Mormugao and Bardez. The lowest advances were in Pernem, Canacona and Sattari. It is evident that the talukas of Tiswadi, Bardez, Salcete and Mormugao, comprising the important commercial centers of Goa, have been dominating the banking scene. These talukas have been the highest ranking talukas with respect to both access and usage of banking services.

**Table 2:** Descriptive Statistics of Indicators of Different Dimensions of Financial Inclusion

<b>A) Access Dimension</b>											
	<b>1994-95</b>		<b>2000-01</b>		<b>2005-06</b>		<b>2009-10</b>		<b>2014-15</b>		
	GP	DP									
Minimum	1.43	1.41	1.79	1.88	1.79	1.74	2.03	1.64	2.75	1.95	
Maximum	30.14	4.23	40.74	5.43	43.68	5.48	45.98	5.55	69.76	6.14	
Mean	13.01	2.42	17.08	2.89	18.26	2.86	20.7	3.05	30.34	3.49	
SD	12.05	0.86	16.25	1.07	17.49	1.14	19.47	1.21	28.07	1.26	
CV	0.93	0.35	0.95	0.37	0.96	0.40	0.94	0.40	0.93	0.36	

<b>B] Usage Dimension</b>										
	1994-95		2000-01		2005-06		2009-10		2014-15	
	TD	TC	TD	TC	TD	TC	TD	TC	TD	TC
Minimum	15.69	6.38	46.01	13.26	74.73	25.55	133.48	53.81	294.72	142.81
Maximum	888.88	378.50	2479.0	957.40	5777.00	1569.60	8351.60	4568.80	16037.82	6771.09
Mean	291.61	96.79	765.08	218.65	1613.90	386.84	2682.30	878.34	5055.59	1588.15
SD	358.87	116.55	944.23	291.52	2057.00	491.32	3246.40	1324.70	6007.57	2079.48
CV	1.23	1.20	1.23	1.33	1.27	1.27	1.21	1.51	1.19	1.31

Note: (i) The values for GP and DP are computed on the basis of the data from the Reports on Credit-Deposit Ratio in Goa 1994-95 to 2014-15, Directorate of Planning, Statistics and Evaluation, Government of Goa.

(ii) The values for TD and TC are actual values obtained from the Reports on Credit-Deposit Ratio in Goa 1994-95 to 2014-15, Directorate of Planning, Statistics and Evaluation, Government of Goa.

(iii) SD= standard deviation and CV = Coefficient of variation

Table 2 presents some descriptive statistics of the available data for computing the index of financial inclusion for selected years between 1994-95 and 2014-15. Statistics pertaining to each dimension (and to each indicator pertaining to each dimension) of the index are presented.

As far as the access dimension is concerned, on an average, geographic penetration has steadily increased from 13.01 branches per 100 square kilometers in 1994-95 to 30.04 branches per 100 square kilometers in 2014-15. On an average, demographic penetration increased from 2.42 bank branches per 10000 people in 1994-95 to 3.89 bank branches per 10000 people in 2000-01. It registered a slight decline in 2005-06, but rose to 3.49 bank branches per 10000 people in 2014-15 (Table 2). It can be observed that for both geographic and demographic penetration, the maximum and minimum value recorded has been increasing over the period. On an average there has been an increase in the access to banking services in Goa. As far as geographic penetration is concerned, the coefficient of variation has been substantially high, but it was more or less the same over the period of study being 0.93 in 1994-95 and in 2014-15. The coefficient of variation for demographic penetration has been comparatively lower, increasing marginally from 0.35 in 1994-95 to 0.36 in 2014-15.

As far as the usage dimension is concerned, on an average, total deposits increased from Rs.291.61 crores in 1994-95 to Rs.5055.59 crores in 2014-15, whereas total credit increased from Rs.96.79 crores in 1994-95 to Rs.188.15 crores in 2014-15 (Table 2). The maximum and minimum values for total deposits and total credit have increased substantially over the period. The coefficient of variation has been high for both deposits and credit. It showed a decline from 1.23 to 1.19 in the case of total deposits, whereas it rose from 1.20 to 1.31 in the case of total credit for the same period. It is revealed that the usage of banking facilities has also increased over the period.

## Index of Financial Inclusion for Goa

The Index of Financial Inclusion (IFI) has been computed for all the talukas in the state of Goa. Since the IFI depends on the access and usage dimensions, the index of access and usage dimensions are discussed first. Table 3 presents the computed index values for the two dimensions respectively for selected years between 1994-95 and 2014-15.

**Table 3:** Index Values for Dimensions of Financial Inclusion

Year Taluka	1994-95		2000-01		2005-06		2009-10		2014-15	
	Access	Usage								
Tiswadi	0.599	0.400	0.600	0.375	0.600	0.345	0.599	0.400	0.599	0.400
Bardez	0.481	0.236	0.437	0.207	0.459	0.189	0.512	0.164	0.564	0.213
Pernem	0.026	0.002	0.049	0.003	0.045	0.001	0.064	0.001	0.119	0.006
Bicholim	0.143	0.040	0.078	0.022	0.083	0.019	0.095	0.018	0.102	0.019
Sattari	0.002	0.000	0.003	0.000	0.003	0.001	0.001	0.001	0.003	0.001
Ponda	0.198	0.057	0.167	0.055	0.174	0.052	0.249	0.065	0.235	0.063
Sanguem	0.106	0.016	0.039	0.009	0.034	0.005	0.052	0.007	0.046	0.006
Canacona	0.082	0.005	0.063	0.004	0.076	0.003	0.118	0.005	0.120	0.004
Quepem	0.061	0.018	0.035	0.019	0.045	0.018	0.050	0.016	0.053	0.015
Salcete	0.403	0.302	0.372	0.298	0.378	0.305	0.451	0.261	0.451	0.279
Mormugao	0.415	0.153	0.394	0.136	0.386	0.170	0.400	0.145	0.382	0.138

Note: The index values computed in this table are based on data from the Reports on Credit-Deposit Ratio 1994-95 to 2014-15, Directorate of Planning, Statistics and Evaluation, Government of Goa

The indicators used to compute the index for the access dimension are geographic penetration and demographic penetration. These indicators are given equal weights and the average of these indexes represents the index for the access dimension. The index value for the access dimension was the highest for Tiswadi (0.599) followed by Bardez (0.564), Salcete (0.451) and Mormugao (0.382) in 2014-15. The ranking remained more or less the same throughout the period, the only exception being that Mormugao occupied the third position in 1994-95, 2000-01 and 2005-06 but moved to the fourth position in 2014-15. The lowest ranking talukas were Sattari, Sanguem, Quepem, Pernem, and Canacona in 1994-95 and in 2014-15.

The index value for Sattari taluka has been noticeably very low and was close to zero thereby making Sattari the lowest ranking taluka in terms of access.

The indicators used to compute the index for the usage dimension are total deposits and total credit. These indicators are also given equal weights and the average of these indexes represents the index for the usage dimension. As far as the usage dimension is concerned, the index value was the highest for Tiswadi (0.400) followed by Salcete (0.279), Bardez (0.213) and Mormugao (0.138) in 2014-15. The ranking has remained the same throughout the period. The lowest ranking talukas were Sattari, Pernem, Sanguem, Canacona and Quepem in 1994-95 and in 2014-15. As in the case of the access dimension, the index value of the usage dimension for Sattari taluka was very low and has been zero or close to zero throughout the period, thereby making Sattari the lowest ranking taluka in terms of usage.

It can be observed that for the period of study, Tiswadi has ranked the highest for both the access and usage dimensions. Bardez ranked second for the access dimension but third for the usage dimension. It is revealed that Salcete has performed better than Bardez for the usage dimension. This implies that even though the access to banking services as measured by banking penetration has not

been as high in Salcete as compared to Bardez, the usage of banking services in terms of deposits and credit has been relatively higher there. The larger deposits are probably due to the larger inflow of foreign remittances and the larger credit could be attributed to the greater industrial development and hence greater need for credit in Salcete. Mormugao taluka seems to have been performing better in terms of access as compared to usage of banking services. Bicholim and Ponda talukas have also fared better in terms of access as compared to usage. The same is the case in Canacona, Pernem, Sanguem Quepem and Sattari. Sattari has ranked the lowest in terms of both access and usage of banking services, the index values being close to zero for the entire period.

Table 4 presents the IFI values and the categorization of talukas for selected years between 1994-95 and 2014-15. As evident from the table, and as expected, the talukas across the state of Goa are at different levels of financial inclusion.

**Table 4:** IFI Values and Categorization of Talukas in Goa

Year Taluka	1994-95		2000-01		2005-06		2009-10		2014-15	
	IFI	Category								
Tiswadi	0.999	High	0.973	High	0.942	High	0.999	High	0.998	High
Bardez	0.731	High	0.661	High	0.668	High	0.698	High	0.786	High
Pernem	0.035	Low	0.063	Low	0.057	Low	0.082	Low	0.152	Low
Bicholim	0.200	Low	0.109	Low	0.113	Low	0.129	Low	0.137	Low
Sattari	0.003	Low	0.004	Low	0.005	Low	0.002	Low	0.004	Low
Ponda	0.277	Low	0.237	Low	0.245	Low	0.342	Medium	0.325	Medium
Sanguem	0.140	Low	0.053	Low	0.046	Low	0.069	Low	0.061	Low
Canacona	0.105	Low	0.081	Low	0.097	Low	0.150	Low	0.153	Low
Quepem	0.086	Low	0.055	Low	0.066	Low	0.072	Low	0.074	Low
Salcete	0.696	High	0.657	High	0.670	High	0.720	High	0.736	High
Mormugao	0.593	Medium	0.557	Medium	0.574	Medium	0.571	Medium	0.546	Medium

Note: The IFI values computed in this table are based on data from the Reports on Credit- Deposit Ratio 1994-95 to 2014-15, Directorate of Planning, Statistics and Evaluation, Government of Goa

In the year 2014-15, for instance, the levels of financial inclusion, as measured by the IFI, varied from as low as 0.000 for Sattari to as high as 0.998 for Tiswadi. For the entire period of study, Tiswadi has been the highest ranking taluka with respect to the IFI. The value of the IFI has been very close to 1 in Tiswadi, thus implying that Tiswadi has the highest level of financial inclusion as compared to all the other talukas. In 2014-15, the highest ranking talukas were Tiswadi (0.998), followed by Bardez (0.786), Salcete (0.736), and Mormugao (0.546). The ranking has remained more or less the same throughout the period, with the exception that Bardez occupied the second position and Salcete occupied the third position in 1994-95, 2000-01 and 2012-13,

At the other extreme, Sattari has been the lowest ranking taluka with respect to the IFI. In Sattari taluka, the IFI has been very close to zero throughout the period and hence Sattari can be characterized as the taluka with the lowest level of financial inclusion. In 1994-95, the IFI was the lowest in Sattari (0.003), followed by Pernem (0.035), Quepem (0.086) and Canacona (0.105). The situation changed in 2000-01 with Quepem, Sanguem and Pernem becoming the second, third and fourth lowest

ranking talukas respectively. Thereafter the situation worsened in Sanguem as it became the second lowest ranking taluka in 2005-06. However, between 2005-06 and 2014-15, the IFI showed a significant improvement in Canacona. This is attributable to the deeper banking penetration in Canacona due to the increase in bank branches implying greater access to banking services there. However, though there was improvement in access to banking services in Canacona, there was no corresponding improvement in usage. This indicates that there is no guarantee that if a region fares better in terms of access, it will necessarily fare better in terms of usage of banking services. Nevertheless there was an improvement in the overall IFI in Canacona. In 2014-15, the lowest ranking talukas continued to be Sattari (0.004), followed by Sanguem (0.061), Quepem (0.074) and Pernem (0.152).

Generally, it is expected that with development and improvements in incomes financial inclusion is likely to improve. Further, a major decline in IFI values is not expected, unless there are situations such as financial crisis or outbreak of war. Thus, in general, we could expect the IFI values to improve for all regions over the years. In the present study, there has been no consistent or significant change in the IFI over a period of time.

The talukas have been placed into three categories on the basis of their IFI values as follows:

1.  $0.6 \leq \text{IFI} \leq 1$  – high financial inclusion
2.  $0.3 \leq \text{IFI} < 0.6$  – medium financial inclusion
3.  $0.0 \leq \text{IFI} < 0.3$  – low financial inclusion

Tiswadi, Bardez and Salcete talukas have had consistently high IFI values of above 0.6 throughout this period and are categorized as talukas with high financial inclusion. Mormugao has been in the range of medium financial inclusion throughout, the value of the IFI being between 0.5 and 0.6. Ponda, on the other hand, has moved from being a low IFI taluka to being a medium IFI taluka in 2009-10. All the remaining six talukas are categorized in the category of low level of financial inclusion, the IFI values ranging between 0 and 0.3. Within this category, Sattari has had the lowest IFI values throughout. The talukas of Sanguem, Quepem and Pernem have also had low values of IFI, generally below 0.1 throughout the period.

## **Factors Determining Financial Inclusion**

There are several factors that affect financial inclusion and the interaction of these factors with each other is likely to be significant. Sarma and Pais (2011) identified certain factors and categorized them as (i) socio-economic factors such as income, employment, inequality, educational attainment, literacy and so on, (ii) factors relating to physical infrastructure such as road network, telephone and television network, access to information through newspapers, radio, cable TV, computer and internet and (iii) banking sector factors such as soundness of the banking system, ownership pattern of banks and interest rates.

Several studies have highlighted the importance of socio-economic factors in influencing financial inclusion. These factors include income levels, income distribution, caste, religion, education, urbanization and migration (Barr 2004; Devlin 2009; Sarma and Pais 2011; Buckland *et al.*, 2005). Studies have shown

that people living in rural areas and in locations that are remote from urban areas are more likely to be financially excluded (Leyshon and Thrift 1995; Kempson and Whyley 2001; Beck and Brown 2011). Employment has also been found to be associated with financial inclusion (Goodwin *et al.*, 1999).

Studies have shown that the use of banking services is found to be more common among households located in urban areas, households with higher income and wealth, as well as for households in which an adult member had professional education and formal employment (Martinez 2006; Beck and Brown 2011; Pal and Pal 2012). Rural population or the proportion of rural population has been found to be negatively associated with financial inclusion. In other words, urbanisation is positively associated with financial inclusion (Sarma and Pais 2011; Solo and Monroth 2006; Al-Hussainy *et al.*, 2008). Urbanization is considered to be an important factor influencing financial inclusion. Urbanization is defined here as the percentage of urban population to total population. For the present study, the figures for urbanization are available only for the census years. For the years in between the census years, the figures have been arrived at by the interpolation method by using the percentage change method. Urbanization is accompanied by industrialization and economic development. In the present analysis, urbanization is expected to be a positive determinant of financial inclusion.

Higher literacy rates, particularly adult literacy, have also been found to be positively associated with financial inclusion (Sarma and Pais 2011). The level of education of the people in a region influences the level of financial inclusion (Kliza and Pederson 2002; Caskey *et al.*, 2006; Al-Hussainy *et al.*, 2008; Ghosh 2011; Cull and Scott 2011; Seluhinga 2013). In the present analysis, the total number of students enrolled in schools at the higher secondary education level, colleges and university is considered as a proxy for the education level. It is believed that generally an individual who has completed his/her higher secondary education, graduation or post-graduation, would be in a better position to make financial decisions than an individual who is a school dropout. Hence, this is considered as an important factor determining financial inclusion. An increase in the number of students enrolled, and hence in the level of education, is expected to be a positive determinant of financial inclusion.

Tourism is one of Goa's fastest growing industries. Tourism does have significant direct benefits at the local level by generating employment and improving wages, and several indirect effects such as stimulating growth in tourism-related activities such as services and transportation. Tourism revenues go beyond hotel operators and employees, tour operators and restaurateurs. Tourist expenditures are typically incurred partly on local goods and services, further raising output and incomes. Thus, tourism does have an impact on financial inclusion as well. It is argued here that an increase in the number of tourists in a particular region will result in higher levels of financial inclusion. In other words, there is a direct relationship between tourist arrivals and financial inclusion.

In order to understand the factors affecting financial inclusion, a multiple regression model is developed and estimated. A pooled regression model is estimated using the method of ordinary least squares using data of the 11 talukas for

period 1994-95 to 2014-15. In the present analysis, a pooled regression approach is used instead of a fixed effects or random effects model for the simple reason that the talukas that are pooled together do not show much heterogeneity. In the present analysis, the dependent variable,  $y$ , is a logit transformation of the index of financial inclusion (IFI). While the IFI lies between 0 and 1, the transformed variable lies between  $-\infty$  and  $\infty$ . By incorporating the transformed variable, we are able to carry out the classical OLS regression (Sarma and Pais 2011; Singh and Kodan 2011). The transformed variable,  $y$ , is a monotonically increasing function of IFI. The transformed variable,  $y$ , is a logit function of the IFI.

It is defined as follows:

$$y = \ln \left[ \frac{IFI}{1-IFI} \right] \dots\dots\dots (6)$$

The general form of the regression equation is

$$y = \beta_0 - \beta_1 X_1 - \beta_2 X_2 + \dots - \beta_n X_n - u \dots\dots\dots (7)$$

In the present analysis, the transformed IFI variable,  $y$ , is regressed over three socio-economic variables namely, urbanization, student enrollment and tourist arrivals. The transformed IFI variable,  $y$ , is expressed as a function of these three independent variables and the regression equation is expressed as follows:

$$y = \beta_0 + \beta_1 SE - \beta_2 UR - \beta_3 TA - u \dots\dots\dots (8)$$

where:  $y$ =Transformed IFI

SE=Number of students enrolled in schools at the post-matric level, colleges and university

UR=Percentage of urban population to total population

TA=Number of tourist arrivals (domestic and foreign)

It is hypothesized that all the three independent variables, namely, student enrolment (SE) which is considered as a proxy for education level, urbanization (UR) and tourist arrivals (TA), are positive determinants of financial inclusion. Urbanization and tourist arrivals could be considered as proxies for economic development. The analysis is restricted to these three variables on account of non-availability of taluka-wise data for other relevant variables such as income and employment.

The results of the regression are presented in Table 5. The results of the regression model are satisfactory and interesting. It can be seen that all the three independent variables are found to have a positive impact on financial inclusion as the estimated coefficients have positive signs which are the expected signs as stated. The estimated coefficients are significant at 1% level.

The coefficient of student enrolment is positive and highly significant. Thus, student enrolment is found to have a positive impact on financial inclusion thus implying higher levels of financial inclusion at higher levels of education. Urbanization is also found to have a positive impact on financial inclusion. This means that as the proportion of urban population to the total population increases, the level of financial inclusion will also increase. Tourist arrivals are also positively related to financial inclusion. This implies that as the number of tourists

increases, the level of financial inclusion will also increase. The model has been corrected for heteroskedasticity and robust standard errors have been reported.

**Table 5:** Results of Regression Analysis

<b>Dependent Variable: <math>y</math> [<math>y = \ln(\text{IFI}/(1-\text{IFI}))</math>]</b>				
<b>Variable</b>	<b>Coefficients</b>	<b>Standard Error<sup>#</sup></b>	<b>t- ratio</b>	<b>p- value</b>
Constant	-4.5372	0.2436	-18.620	0.000***
SE	0.0002	0.00004	6.344	0.000***
UR	0.0427	0.0046	9.249	0.000***
TA	0.000002	0.0000007	3.287	0.001***
No. of observations	231			
F (3,227)	103.73			
P-value (F)	0.000			
R- squared	0.695			
Adjusted R- squared	0.691			

Note: #Robust standard errors

\*\*\*Significant at 0.01 level

The adjusted R squared is 0.691, which is fairly good considering the fact that we have used pooled data. The model fits well because 69.1% of the variation in the dependent variable is explained by the explanatory variables. The F-value is 95.75 and the p-value of obtaining an F-value of 95.75 or greater is practically zero. This reveals that all independent variables jointly determine the dependent variable and the model is very good. In other words, all the explanatory variables are found to be individually and collectively statistically significant.

## Conclusions and Policy Implications

It is evident from the study that there has been a phenomenal growth of banking facilities in Goa. However, financial inclusion in the context of access and usage has not been satisfactory. Moreover, bank branches are not evenly distributed across the state. There are wide disparities in financial inclusion across the talukas. The talukas of Tiswadi, Bardez, Salcete and Mormugao have been the highest ranking talukas in terms of both access and usage of banking services for the period of study. Sattari has been the lowest ranking *taluka* in terms of both dimensions of financial inclusion. The study shows that even though a region performs better in terms of the access dimension, it does not necessarily perform better in terms of the usage dimension.

The IFI values clearly indicate that the level of financial inclusion is significantly low in large parts of the state of Goa. The talukas of Tiswadi, Bardez and Salcete have had consistently high IFI values, whereas Mormugao has been in the range of medium financial inclusion throughout the period 1994-95 to 2014-15. All the other talukas have had low levels of financial inclusion, with the exception of Ponda, which moved from low levels to medium levels of financial inclusion in 2009-10. It is observed from the study that although there has been an improvement in outreach activity in the banking sector, the achievement is not significant. The findings also

indicate that regions characterized by low levels of education, lower degree of urbanization and lower levels of tourist arrivals seem to be less financially inclusive. In other words, regions that are less developed are also less financially inclusive. From the above analysis, it can be seen that though Goa has been declared as a completely financially inclusive state, the degree of financial inclusion varies across talukas. The level of development has a direct correlation with the degree of financial inclusion and concerted efforts need to be made to bring about the development of the backward and less developed regions. The government has to initiate steps to attain more balanced regional development to make financial inclusion more meaningful. Each region has its own peculiar characteristics and therefore it is imperative to adopt region-specific measures. Government policy to improve levels of education and urbanization, and also to promote tourism, will have a positive impact on the status of financial inclusion in Goa.

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