CHAPTER IV

METHODOLOGY

An appropriate methodology enables the researcher to carry on the investigation in the right direction and work in a scientific manner. The method of research provides tools and techniques by which the research problem is addressed. Adopting suitable methods of research becomes important to reach the set objectives. Likewise selecting relevant tools also becomes imperative for enhancing the quality of research output. Testing of hypotheses, guide the researcher to make probable statement about the population parameters. Therefore research methodology is a way of systematically analyzing the research problem. Hence the present chapter discusses the methodology applied, hypotheses formulated and tools used in studying and analyzing the research problem. The target population and the process of sample selection are discussed in this chapter extensively. Understanding the geographical features adds to the knowledge one has regarding the problem and about the population. Accordingly the geographical areas of study are also highlighted in the context of the problem to be studied.

A comprehensive measure, such as the index proposed in this paper, is required to compare financial inclusion among regions. A comprehensive measure of financial inclusion should be able to incorporate information on several aspects (dimensions) of financial inclusion, preferably in one single number. Such a measure can be used to compare the levels of financial inclusion across economies and across states/provinces within countries at a particular time point. It can be used to monitor the progress of policy initiatives for financial inclusion in a country over a period of time. Further, such a measure can be of useful to address questions of academic interest that have been put forward in the growing literature on financial inclusion.
4.1.1 Description of the Study Area

To study about financial inclusion, threefold study has been done. First 28 Indian states and 4 union territories were selected. From Indian states Tamilnadu was selected for learn about district wise financial inclusion. From Tamilnadu, Valathi village in Villupuram district is selected for detailed study as it got the least rank in district wise financial inclusion.

i) India, officially the Republic of India, is a country in South Asia. It is the seventh-largest country by area, the second-most populous country with over 1.2 billion people, and the most populous democracy in the world. Bounded by the Indian Ocean on the south, the Arabian Sea on the south-west, and the Bay of Bengal on the south-east, it shares land borders with Pakistan to the west; China, Nepal, and Bhutan to the north-east; and Burma and Bangladesh to the east. In the Indian Ocean, India is in the vicinity of Sri Lanka and the Maldives; in addition, India's Andaman and Nicobar Islands share a maritime border with Thailand and Indonesia.

Home to the ancient Indus Valley Civilisation and a region of historic trade routes and vast empires, the Indian subcontinent was identified with its commercial and cultural wealth for much of its long history. Four world religions—Hinduism, Buddhism, Jainism, and Sikhism—originated here, whereas Zoroastrianism, Christianity, and Islam arrived in the 1st millennium CE and also helped shape the region's diverse culture. Gradually annexed by and brought under the administration of the British East India Company from the early 18th century and administered directly by the United Kingdom from the mid-19th century, India became an independent nation in 1947 after a struggle for independence that was marked by non-violent resistance led by Mahatma Gandhi.

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91 .wiki pedia
The Indian economy is the world's tenth-largest by nominal GDP and third-largest by purchasing power parity (PPP). Following market-based economic reforms in 1991, India became one of the fastest-growing major economies; it is considered a newly industrialised country. However, it continues to face the challenges of poverty, corruption, malnutrition, inadequate public healthcare, and terrorism. A nuclear weapons state and a regional power, it has the third-largest
standing army in the world and ranks eighth in military expenditure among nations. India is a federal constitutional republic governed under a parliamentary system consisting of 28 states and 7 union territories. India is a pluralistic, multilingual, and multi-ethnic society. It is also home to a diversity of wildlife in a variety of protected habitats.

ii) TamilNadu 92 is one of the 28 States of India. It lies in the southernmost part of the Indian peninsula and is bordered by the Union territory of Pondicherry and the states of Kerala, Karnataka and Andhra Pradesh. It is bound by the Eastern Ghats in the north, Kerala in the west, the Bay of Bengal in the east and the Indian Ocean in the south. It covers an area of 130,058 km.

TamilNadu is the eleventh largest state in India by area and the seventh most populous state. It is the second largest state economy in India as 2012. It is also most urbanized state in India. The state has the highest number (10.56 percent) of business enterprises and stands second in total employment in India compared to the population share of six percent.

Chennai is the capital of TamilNadu. The history of Chennai illustrates that the city is about 400 years old and is also the 36th metropolitan city all across the world. For administrative purposes Chennai is divided into five talukas, namely Egmore-Nungambakam, Fort Tondiarpet, Mambalam-Guindy, Mylapore-Triplicane and Perambur-Purasawalkkam. The Chennai Metropolitan area consists of three districts namely Chennai city and the districts of Kanchipuram and Thiruvallur. The city area covers an area of 476 km. (184 sq. mi). The metropolitan area covers 1,177 km (455 m). The city is divided on the basis of composition into four major parts: North, Central, South and West.

North Chennai is primarily an industrial area. Central Chennai is the commercial heart of the city and the down town area. South Chennai and West Chennai, previously predominantly residential areas are fast turning into commercial areas, hosting a large number of IT and financial companies.

92. Wikipedia
The city is a base to around 30 percent of India's automobile industry and 40 percent of auto components industry. A large number of automotive companies have manufacturing plants in Chennai. It also contributes more than 50 percent of India’s leather exports. The city is served by two major ports: Chennai port and Ennore Port. Chennai port is one of the largest artificial ports in India and it allures a large number of people and offers employment and occupation.

**Figure 4.2 TamilNadu Map**

Source:www.mapsofindia.com
iii. Viluppuram \textsuperscript{93} District was earlier a part of Cuddalore District. It was then bifurcated from Cuddalore and became a separate district on 30th September 1993. Because of this, the history of Viluppuram district closely resembles that of Cuddalore. The Cholas were the early rulers. Among these rulers, Karikala Chola was the most famous and powerful. For a short period, the Cholas were overthrown by Simha Vishnu Pallava and the Region came under the Pallava rule for sometime. Vijayalaya Chola again revived Chola rule. This was the beginning of great Chola Empire. The later Chola rulers were weak and the power passed on to the hands of Eastern Chalukyas.

Cholas regained their lost position but with the rise of Jatavarman Sundara Pandya-1 (1251 A.D), Chola supremacy came to an end. The sway of Pandyas lasted for over 50 years, followed by Muslim domination from 1334 to 1378 A.D. By 1378, the region came under the rule of Vijayanagar Kingdom and Nayaks were appointed as the rulers of the region.

In 1677 Shivaji took Ginjee area with the assistance of Golkonda forces. Then came the Mughals. During the Mughal regime, both the English and French acquired settlements in South Arcot. During the Anglo-French rivalry, the entire district was turned into a war land. After sometime, the entire area came under the control of East India Company. It remained under British authority till 1947 when India became independent.

Viluppuram District lies between 11 38' 25" N and 12 20' 44" S: 78 15' 00" W and 79 42' 55" E with an area of 7194 Sq. Km. It was carved out from the South Arcot District on 30.09.1993 and was rechristened as Viluppuram District. The residual part of the erstwhile South Arcot district was named as Cuddalore District.

It is surrounded on East and South by Cuddalore District. The West by Salem and Dharmapuri District and on the North by Thiruvannamalai and Kanchipuram District.

\textsuperscript{93} Wikipedia
At present Vilupuram district comprises of 1490 Revenue Villages, 4 Revenue Divisions, 9 Administrative Taluks, 22 Blocks, 15 Town Panchayat Unions, 1104 Village Panchayats and 3 Municipalities.

The General geological formation of the District appears to be simple. The greater part of it is covered by the Metamorphic rocks belonging to Genesis family. There are also three great groups of sedimentary rocks belonging to different geological periods. The Kalrayan Hills in the North represents a continuous range of hills covered with some thorny forests and vegetation. Among the hills, the most beautiful part of the district lies, round about the Gingee Hills.
iv) Valathi,\textsuperscript{94} also known as Valathy, is a village in Gingee assembly constituency, Villupuram district, in the state of TamilNadu, India. Valathi is a very tiny village, which has surrounded by natural resources such as lakes & mountains. Valathi is surrounded by mountains and lakes. Valathi derives is on the main road (SH4) connecting Vellore and Villupuram. It is a fairly big village which surrounded by many small villages. The majority of these populations are dependent on agriculture and cattle for their income. As per latest survey the village consists of Nair or Samanar (Tamil Jains), Christians, Scheduled Castes, Gounder, and Muslims, Naidu, Naikkar.

4.2 Source of Data

This study entitled ‘An empirical analysis of financial inclusion in India - A case study of TamilNadu’ is both descriptive and analytical in nature. It is mainly based on the secondary data during the study period. However, primary data collected was also employed to study the problem.

4.2.1 Secondary Data

In the process of analyzing the problem the secondary data sources available have been referred to the maximum. The primary source of information is gathered from published documents, official reports and published and unpublished reports. In order to get an understanding and relevance of the problem, various researches in the field were analyzed and reviewed. In addition to a number of working papers, articles and research works in the area and the areas related to it were also examined. Relevant information has been culled out from books and various websites. To find out financial inclusion index, only data on scheduled commercial banks were taken in to account.

\textsuperscript{94} Wikipedia
V. Organisational Structure of the Banks

The entire organised banking system comprises of scheduled and non-scheduled banks. Unscheduled banks form a very small component. Banking needs of the financially excluded population is catered to by other unorganised entities distinct from banks, such as, moneylenders, pawnbrokers and indigenous bankers. This research considers only schedule commercial banks data for finding the financial inclusion index.

• Scheduled Banks

A scheduled bank is a bank that is listed under the second schedule of the RBI Act, 1934. In order to be included under this schedule of the RBI Act, banks have to fulfill certain conditions such as having a paid up capital and reserves of at least 0.5 million and satisfying the Reserve Bank that its affairs are not being conducted in a manner prejudicial to the interests of its depositors. Scheduled banks are further classified into commercial and cooperative banks. The basic difference between scheduled commercial banks and scheduled cooperative banks is in their holding pattern. Scheduled cooperative banks are cooperative credit institutions that are registered under the Cooperative Societies Act. These banks work according to the cooperative principles of mutual assistance.

• Scheduled Commercial Banks (SCBs):

Scheduled commercial banks (SCBs) account for a major proportion of the business of the scheduled banks. As at end-March, 2009, 80 SCBs were operational in India. SCBs in India are categorized into the five groups based on their ownership and/or their nature of operations. State Bank of India and its six associates (excluding State Bank of Saurashtra, which has been merged with the SBI with effect from August 13, 2008) are recognised as a separate category of SCBs, because of the distinct statutes (SBI Act, 1955 and SBI Subsidiary Banks Act, 1959) that govern them. Nationalised banks (10) and SBI and associates (7), together form the public sector banks group and control around 70% of the total
credit and deposits businesses in India. IDBI Ltd. has been included in the nationalised banks group since December 2004. Private sector banks include the old private sector banks and the new generation private sector banks— which were incorporated according to the revised guidelines issued by the RBI regarding the entry of private sector banks in 1993. As at end-March 2009, there were 15 old and 7 new generation private sector banks operating in India.

Foreign banks are present in the country either through complete branch/subsidiary route presence or through their representative offices. At end-June 2009, 32 foreign banks were operating in India with 293 branches. Besides, 43 foreign banks were also operating in India through representative offices.

**Figure:4.4: Structure of the Organised Banking Industry**
VI. **Methodology to Construct Financial Inclusion Index**

Financial inclusion, as defined in this study, is the ease of access, availability and usage of the formal financial system by all members of the economy. The growing literature on financial inclusion has provided plenty of evidences of the merits of an inclusive financial system. However, the literature lacks a comprehensive measure that can be used to measure the extent of financial inclusion in India for many years for studying the impact of financial inclusion policies in financial inclusion. This study is an attempt to fill this gap, and thus, an original contribution to the literature.

This study proposes an index of financial inclusion (FII), following a multidimensional approach of Sarma (2008). The IFI developed by Sarma (2008) can be used to compare levels of financial inclusion across economies at a particular time point. It can also be used to monitor the progress of policy initiatives for financial inclusion over a period of time.

And, most important, such an index can be of interest to the research community in order to investigate empirical questions on relationship between development and financial inclusion. The FII incorporates information on various dimensions of an inclusive financial system and it is easy to compute. The financial inclusion index presented here, consider three basic dimensions of an inclusive financial system: banking penetration (BP), availability of the banking services (BS) and usage of the banking system (BU).

As an inclusive financial system should be judged from several dimensions, Sarma follow a multidimensional approach while constructing the index of financial inclusion (IFI). This proposed FII is computed by first calculating a dimension index for each dimension of financial inclusion. The dimension index for the Ith dimension, $d_i$, is computed by the following formula.

$$d_i = \frac{A_i-M_i}{M_i-m_i}$$ (4.1)
where

\[ A_i = \text{Actual value of dimension } i \]

\[ m_i = \text{Lower limit on the value of dimension } i, \text{ fixed by some pre-specified rule.} \]

\[ M_i = \text{Upper limit on the value of dimension } i, \text{ fixed by some pre-specified rule.} \]

Formula (4.1) ensures that \( 0 \leq d_i \leq 1 \). Higher the value of \( d_i \), higher the region’s achievement in dimension \( i \). If \( n \) dimensions of financial inclusion are considered then, a region \( i \) will be represented by a point \( d_i = (d_1, d_2, d_3, \ldots d_n) \) on the “\( n \)” dimensional Cartesian space. In the \( n \)-dimensional space, the point \( 0 = (0,0,0,\ldots,0) \) represents the point indicating the worst situation while the point \( 1 = (1,1,1,\ldots,1) \) represents the highest achievement in all dimensions. The index of financial inclusion, IFI for the \( I \) th region, then, is measured by the normalized inverse Euclidean distance of the point \( d_i \) from the ideal point \( 1 = (1,1,1,\ldots,1) \). The exact formula is

\[
IFI = 1 - \frac{\sqrt{(1-d_1)^2 + (1-d_2)^2 + \ldots + (1-d_n)^2}}{\sqrt{n}}
\]  

(4.2)

In formula (4.2), the numerator of the second component is the Euclidean distance of \( D_i \) from the ideal point ‘1’, normalizing it by \( n \) and subtracting by ‘1’ gives the inverse normalized distance. The normalization is done in order to make the value lies between ‘0’ and ‘1’ and the inverse distance is considered so that higher value of the IFI corresponds to higher financial inclusion.

VII. Points of Difference with UNDP Methodology:

Although the IFI proposed by Sarma follows a multidimensional approach of index construction similar to the UNDP approach, there are methodological differences between the two approaches.
The first point of methodological difference with the UNDP methodology is the manner in which dimension indexes are combined to compute the final index. Unlike the UNDP’s methodology of using an average, this index is based on a measure of the distance from the ideal.

Nathan (2008) have shown that this distance-based approach satisfies several interesting and intuitive properties of a development index, viz. normalization, symmetry (or anonymity), monotonicity, proximity, uniformity and signaling (collectively termed NAMPUS). They have compared how an index based on the distance-based approach and an index based on UNDP’s HDI methodology fare with respect to all of these properties. They show that UNDP’s HDI methodology satisfy only three of these properties while the distance based methodology satisfy all. The failure of the HDI methodology to satisfy all the properties is due to the so-called ‘perfect substitutability’ across dimensions under this methodology. Perfect substitutability implies that an increase in one dimension can be compensated for by a decrease of equal magnitude in another dimension. As all dimensions are assumed to be equally important for the overall index value, the perfect substitutability can hardly be appropriate (Desai 1991). The distance based approach does not suffer from this shortcoming. The second difference is with respect to the choice of minimum and maximum values for the dimensions. While the UNDP methodology uses pre-fixed values for the minimum and maximum for each dimension to compute the dimensional index, we use empirically observed minimum and maximum for each dimension. There are two reasons for using the empirically observed max and min:

It is difficult to fix what should be the minimum/maximum for any dimension of financial inclusion. For several dimensions used in UNDP’s HDI, such as the literacy rate and life expectancy, it may be easy to fix limits for the dimensions (e.g. 0 and 100 for literacy rate and 25 and 85 years for life expectancy) but for the dimensions of financial inclusion, it is not straight forward to determine what should be the lowest (highest) value for a particular dimension. Therefore an

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empirical scheme has been adopted. By using the empirical scheme, it is an attempt to measure financial inclusion with respect to a prevailing situation. Thus, the min and max values for any dimension of the index may change for different points of time. By computing FII in this manner, it is possible to incorporate certain element of relativity in the FII, i.e., it measures the extent of financial inclusion in an economy relative to the prevailing situation in all economies. This way, the index is a dynamic one.

VIII. Financial Inclusion Index Variables used

Banking penetration (dimension 1): An inclusive financial system should have as many users as possible, that is, an inclusive financial system should penetrate widely amongst its users. The size of the “banked” population, i.e. number of people having a bank account is a measure of the banking penetration of the system. Thus, if every person in an economy has a bank account, then the value of this measure would be 1. In the absence of the data on “banked” population, number of bank accounts PER 10000 population is used as an indicator of this dimension. Bank account per 10000 population is calculated using following steps. To create Sampling cluster of size 10000 population, Total population is divided by 10000.

\[
\text{Sampling cluster of size 10000 population (A)} = \frac{\text{TOTAL POPULATION}}{10000}
\]

Then number of bank accounts divided by this sampling cluster

\[
\text{Bank Account per 10000 Population} = \frac{\text{NUMBER OF BANK ACCOUNTS}}{A}
\]

Availability of banking services (dimension 2): The services of an inclusive financial system should be easily available to its users. Availability of services can be indicated by the number of bank outlets (per 10000 population) and/or by the number of ATM per 10000 people, or the number of bank employees per customer. In the absence of comparable data on the number of ATMs and number of bank staff for a large number of states, here the number of bank branches per 100000population is utilized to measure the availability dimension. To create
Sampling cluster of size 100000 population, total population is divided by 100000.

Sampling cluster of size 100000 population (B) = \( \frac{\text{TOTAL POPULATION}}{100000} \)

To find number of bank branches per 100000 population number of bank branches divided by B.

Bank Account per 100000 Population = \( \frac{\text{NUMBER OF BANK BRANCHES}}{B} \)

Usage (dimension 3): This dimension is motivated by the notion that having a bank account is not enough for an inclusive financial system; it is also imperative that the banking services are adequately utilized. In incorporating the usage dimension in the index, two basic services of the banking system – credit and deposit are considered. Accordingly, the volume of credit and deposit as proportion of the state’s or NSDP, districts NDDP has been used to measure this.

\[
\frac{\text{DEPOSIT} + \text{CREDIT}}{\text{NSDP or NDDP}}
\]

Thus, the above three dimensions – penetration, availability and usage – can represent a state or district i by a point \((p_i, a_i, u_i)\) in the three dimensional Cartesian space, such that \(0 \leq p_i, a_i, u_i \leq 1\), where \(p_i, a_i, u_i\) denote the dimension indexes for state or district i computed using formula (1).

In the three dimensional Cartesian space, the point \((0,0,0)\) will indicate the worst situation (complete financial exclusion) and the point \((1,1,1)\) will indicate the best or ideal situation (complete financial inclusion). The FII for the state or district ‘i’ is measured by the normalized inverse Euclidean distance of the point \((p_i, a_i, u_i)\) from the ideal point \((1,1,1)\). Algebraically,
\[ d_i = \frac{A_i - M_i}{M_i - m_i} \]

Where

\[ P_i = \text{penetration} \]

\[ a_i = \text{availability} \]

\[ u_i = \text{usage} \]

While computing an index such as the one proposed here, availability of data is a big challenge. The Reserve bank of India published number of bank accounts, deposits, credits, number of bank branches of Scheduled commercial banks for every year. Scheduled Banks in India constitute those banks which have been included in the Second Schedule of Reserve Bank of India (RBI) Act, 1934. RBI in turn includes only those banks in this schedule which satisfy the criteria laid down vide section 42 (6) (a) of the Act.

Scheduled commercial bank data for the period 2001 to 2011 were used to find out the financial inclusion index. For the usage dimension, deposits and credits of scheduled commercial banks in various Indian states and districts have been taken from Banking Statistics of Reserve Bank. Net State Domestic Product data have been collected from the statistics released by Central Statistical Organization. The researcher used population estimates for non-census years and match these estimates with that as provided by [www.indiastat.com](http://www.indiastat.com).

Data on adult population and geographical area of the states have been taken from Census of India and figures on net districts domestic products have been taken from the Bureau of Applied Economics and Statistics, Government of India.

### 4.2.2 Primary Data

The study is also based on the primary data which was collected from head of the households in Valathi village in Villupuram district, TamilNadu.
Chennai is the capital of TamilNadu. A scheduled questionnaire was used to elicit essential information from the respondents with regard to all that pertains to their financial inclusion.

i. **Development of Research Instrument**

The data required for the study was collected through a comprehensive and well-designed questionnaire. It was prepared, keeping in mind the objectives of the study.

In the first phase the questionnaire was formulated to include all information relating to personal/family and demographic aspects of respondents. Further queries concerning economic conditions, like occupation, income and savings, borrowing practice involved were included. To avoid fatigue and boredom ‘multiple choice questions’ and ‘closed form questions’ were developed. Before commencing this work an extensive study was done on the problem by reading literature related to financial inclusion. Attempts were made to examine the available questionnaires in the same field. Thus drafted questionnaire was discussed with the research guide and other experts in the field.

After the pilot study the questionnaire was revised and improved by eliminating unnecessary items. Additional questions felt necessary were added.

ii. **Sample Selection and Sample Size**

While measuring financial inclusion index for districts of TamilNadu Villupuram district got the least rank. So a village in Villupuram is selected for study. The whole village is surveyed for to bring out better inferences. According to census Valathai village has 765 houses. However in this study the people belong to the outskirts of the village is not considered and 519 house heads were surveyed. This study was intended to analyze whether the qualitative variables play a significant role in financial inclusion.
iii. Method of Data Collection

The researcher personally collected the data from a total number of 519 families. All head of the household of each family that could be traced were visited, met and interviewed. As none of them were able to fill in the schedule, the researcher herself filled in the questionnaire eliciting answers from the people. This provided an opportunity for personal rapport with the people and offer clarifications on the spot on the issues elicited from them as well for observation and verification. Financial Inclusion Index for various districts were calculated from 1997 to 2007. Among the districts mostly Villupuram got the least ranking. So Valathi village in Villupuram district called was selected for field study. The whole village is surveyed which consists of 519 samples.

In this study financial inclusion is measured in three categories. If there is no bank account and insurance they are considered as Unbanked. Even though they have account if they are not actively using it they are considered as inactive users or under banked, and the next category is active users who use their account regularly and if they have active insurance policy they are also considered as active account holders or banked.

iv. Pilot Study

Prior to the conduct of the survey, a pilot study was done in Villupuram with twenty five families. It was greatly helpful in testing the effectiveness of the questionnaire as well as to understand financial inclusion of the people. Based on this preliminary study certain modifications were incorporated into the schedule and the same was used for final survey.

4.3 Objectives of the Present Study

The prime objective of the present study is to assess the nature and extent of financial inclusion in India with special reference to TamilNadu and to identify their contributory factors. However, the specific objectives chosen for the present study are
1. To measure and compare the financial inclusion index for the various states of India

2. To construct and compare the financial inclusion index for the various districts of TamilNadu

3. To identify the factors and its probability of influencing the level of financial inclusion

4. To investigate, the factors responsible for under banking in the study area.

4.4 Hypotheses to be Tested

The researcher framed the following hypothesis to be statistically tested for the present study is

1. There is no difference in financial inclusion among states of India.

2. There is no difference in financial inclusion among districts of TamilNadu.

3. There is no influence of Socio economic variables on financial inclusion of an individual.

4.5 Statistical Tools Applied

The data collected through questionnaire, interviews and observation was carefully analyzed with suitable statistical tools and econometric models. The first stage consisted of examining the survey for correctness and completeness, coding and keying data, to make it amenable for further analyses.

Simple averages, percentage and mean are used to examine the socio-economic characteristics of sample respondents. Cross tabulation with Chi-square ($\chi^2$) and 't' test is used to test the association and significance between variables.

An important way of characterizing functions is by describing their rate of change. Linear functions are characterized by a constant rate of change. So they are
useful for describing such phenomena as motion at constant speed, where the distance travelled changes at a constant rate. However, many phenomena do not happen at a constant rate, and to describe them it is necessary to use functions that are not linear. Quadratic function describes change at non-constant rate.

**Growth Curves** are a new way of thinking that is ideal for longitudinal studies. Instead of predicting a region’s score on a variable (e.g., mean comparison among scores at different time points or relationships among variables at different time points), the researcher predict their growth trajectory level on the variable and the change in the variable. Once growth trajectories were estimated, then it is possible to explain individual differences in trajectories (why some state go up, down, or stay the same).

The compound growth rate was calculated using semi log growth model, taking time as an independent variable. FII is the dependent variable. The growth rate trend equation gives an estimate of constant rate of increase or decrease per unit of time.

\[ \text{Ln (FII of State)}_t = \beta_0 + \beta_1 (\text{Time}) + u_t \]

This will show the percentage decrease or increase in FII of a region over years. The \( R^2 \) values show the co-efficient of determination. The sig value of \( t \) related to time is significant it can be concluded that there is positive or negative growth depending on the values of co-efficient of determination. It can be also be said that time is influencing the growth pattern.

The quadratic function is

\[ \text{FII} = \beta_0 + \beta_1 (\text{Time}) + \beta_2 (\text{Time})^2 + u_t \]

Here Financial inclusion index is the dependent variable (Financial inclusion score). \( \beta_0 \) represent the average state score at baseline when time=0 that is 2001. \( \beta_1 \) represents the overall linear component for the growth trajectory and estimates the average instantaneous rate of growth when time=0 here it is 2001. \( \beta_2 \) shows the rate of change over time.
The growth equation using semi log growth model,

\[ \text{C.G.R} = \left[ \text{Anti Ln} (\beta) - 1 \right] \times 100 \]

It shows the percentage increase in FII of a region over years. The \( R^2 \) value shows the co-efficient of determination. It shows the percentage increase or decrease in FII percentages per time period.

**Multinomial Logit Model** are used to examine the probability of respondents becoming financially excluded, to estimate the ability to save, to transfer money and to analyze the factors which determine to be in ‘the unbanked, the under banked and the banked’ conditions.

### 4.6 Limitations of the Study

The authenticity of data collection through questionnaire has always been questioned, as it may not give very accurate results. This is the inherent limitation of this study. However, sufficient care was taken to derive factual data.

The purpose of the research tool was to get maximum information possible from the respondents. Though ‘multiple choice’ and ‘objective type of questions’ were administered yet the Questionnaire conducted was lengthy and as result clients had constraint of time.

Since most of the respondents were unable read and write, the questionnaire was filled in by the researcher herself. This might have led to evade the reality and give fallacious information.

Many were suspicious and unwilling to answer the queries with the fear that the future consequences in spite of the confidentiality promised and the purpose of the study.

Some of the queries were answered on the basis of memory and could have answered wrongly. Underestimation of figures and exaggerations of conditions were also noted.
The most important limitation lies in the fact that this study found the financial inclusion index for states and districts relative to other districts or states. And financial inclusion “1” does not mean full financial inclusion and “0” does not mean there is no financial inclusion.

The current financial inclusion index was unable to include qualitative variables due to unavailability of data.

The study has covered only Valathi village in Villupuram district as a representative sample. If the whole district is surveyed it will be helpful to bring out some more facts related to low financial inclusion in Villupuram district.

The study constructed financial inclusion Index only from 1997 to 2007 district wise in TamilNadu and 2001 to 2011 states wise in India due to unavailability of data.

Only scheduled commercial banks data considered for measuring financial inclusion index.

4.7 Summary

Studying the research problem with suitable methodology enables to analyze the issues precisely and accurately. Besides, the application of scientific tools provides reliable information. Survey method was employed, that found to be the appropriate for the present study. The process followed was very much helpful to know empirically the extent of exclusion the poor people experience. The problem financial exclusion and the assessment of socio-economic conditions of the people though seems qualitative is analyzed quantitatively to the extent possible by using modern econometric approach.