CHAPTER III
RESEARCH METHODOLOGY

3.1. INTRODUCTION

According to Redman and Mory (1923), the research is a “Systematized effort to gain new knowledge”. Research is an attempt to pursue truth through the methods of study, observation, comparison and experiment.

The research methodology constitutes the blue print for data collection, measurement and analysis of data. It is the overall operational pattern or framework of the research that stipulates what information to be collected from which sources and by what procedures.

3.2. SELECTION OF STUDY AREA

Coimbatore District is one of the most affluent and industrially advanced districts of Tamil Nadu in India. It has the highest GDP among the districts of Tamil Nadu, even ahead of the state capital Chennai. The headquarters of the district is Coimbatore, the second largest city in Tamil Nadu, the higher revenue yielding district in the state next to Chennai.

Among the regional stock exchanges located in India, Coimbatore District has been selected for the present study as Coimbatore District is one of the leading business centers in south India and the youngest stock exchange in Tamil Nadu.

In 2011, Coimbatore District had a population of 3,472,578 of which men and women were 1,735,362 and 1,737,216 respectively. The
population was grown 18.46 percent as compared to 2001 population. In the previous census of India 2001, Coimbatore District recorded an increase of 16.96 percent to its population compared to the population of 1991. The average literacy rate of Coimbatore in 2011 was 84.31 compared to 78.50 of 2001. The gender wise men and women's literacy rates were 89.49 and 79.16 respectively. For the 2001 census, same figures stood at 85.71 and 71.06 in Coimbatore District. Textiles are the major industry in Coimbatore District. It is one of the important textile hubs of India. Coimbatore District is also called the “Manchester of South India” as it houses many textile industries. In the rain shadow region of the Western Ghats, Coimbatore District enjoys a very pleasant climate all the year round, aided by the fresh breeze that flows through the 25 kms long Palakkad gap. The rich black soil of the region has contributed to flourishing agriculture industry and it is in fact the reason for the successful growth of cotton that served as a foundation for the establishment of its famous textile industry. As a result, Coimbatore District witnesses a strong economy and reputation as one of the greatest industrial cities in South India.

Table 3.2. Coimbatore District Population Description

<table>
<thead>
<tr>
<th>Description</th>
<th>2011</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Population</td>
<td>3,472,578</td>
<td>2,916,620</td>
</tr>
<tr>
<td>Men</td>
<td>1,735,362</td>
<td>1,482,228</td>
</tr>
<tr>
<td>Women</td>
<td>1,737,216</td>
<td>1,434,392</td>
</tr>
<tr>
<td>Population Growth</td>
<td>18.46%</td>
<td>16.96%</td>
</tr>
<tr>
<td>Area sq. km</td>
<td>4,850</td>
<td>4,850</td>
</tr>
<tr>
<td>Density/km²</td>
<td>748</td>
<td>631</td>
</tr>
<tr>
<td>Proportion to Tamil Nadu Population</td>
<td>4.81%</td>
<td>4.67%</td>
</tr>
</tbody>
</table>
Table 3.2. (Continued)

<table>
<thead>
<tr>
<th>Description</th>
<th>2011</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Sex Ratio (0-6 Age)</td>
<td>963</td>
<td>963</td>
</tr>
<tr>
<td>Sex Ratio (Per 1000)</td>
<td>1001</td>
<td>968</td>
</tr>
<tr>
<td>Average Literacy</td>
<td>84.31</td>
<td>78.50</td>
</tr>
<tr>
<td>Literacy of Men</td>
<td>89.49</td>
<td>85.71</td>
</tr>
<tr>
<td>Literacy of Women</td>
<td>79.16</td>
<td>71.06</td>
</tr>
<tr>
<td>Literates</td>
<td>2,678,637</td>
<td>2,056,377</td>
</tr>
<tr>
<td>Men Literates</td>
<td>1,418,291</td>
<td>1,140,737</td>
</tr>
<tr>
<td>Women Literates</td>
<td>1,260,346</td>
<td>915,640</td>
</tr>
</tbody>
</table>

*Source: Population Census 2011*

3.3. MAJOR CITIES AND SUB-URBS OF COIMBATORE DISTRICT

The following are the major cities and suburbs included for data collection.

1. **Coimbatore** - Capital of the district and the second largest city in Tamil Nadu. Major manufacturing and commercial center in the region, nicknamed the ‘Manchester of South India’.

2. **Pollachi** - Major agricultural trading centre (in the south of Coimbatore).

3. **Kinathukadavu** - A Suburb of Coimbatore city, which is included in Coimbatore Corporation located in the mid of Coimbatore and Pollachi, famous for Tomato market and Fencing Stones.

4. **Mettupalayam** - Agriculture centre (arecanut and betel), located in the north of Coimbatore.

5. **Valparai** - Famous hill station in the district (in the south of Coimbatore)
6. **Sirumugai** - A town panchayat, rich in agriculture and textile. It is famous for Koorai pattu, SIV industry (rayon) and temples (in the north of Coimbatore).

7. **Annur** - A Suburb of Coimbatore city, which is included by the Coimbatore Corporation rich in textile industry and agriculture (in the northeast of Coimbatore on the National Highway 209).

8. **Sulur** - A Suburb of Coimbatore city included by the Coimbatore Corporation, rich in the textile industry (in the east of Coimbatore).

9. **Vellalore** is a part of Coimbatore City on the north bank of Nooyal. It is rich in agriculture.

There are more than 25,000 small, medium, large scale industries and textile mills in Coimbatore. It also has central textile research institutes like the Central Institute for Cotton Research (CICR) - Southern Regional Station and the Sardar Vallabhai Patel International School of Textiles and Management. The South Indian Textiles Research Association (SITRA) is also based on Coimbatore. Coimbatore is also famous for the manufacturing of motor pump sets and varied engineering goods. There are many electric pump manufacturing companies in and around Coimbatore, such as Deccan, CRI, Texmo, KSB and Sharp. Coimbatore also houses some auto component manufacturing brands such as Roots, Pricol and LGB. German auto component major, Robert Bosch started their Research and Development facility in Coimbatore. Coimbatore also houses many Information Technology and Business Process Outsourcing companies, such as Cognizant Technology Solutions and Perot Systems.
3.4. DESIGN OF THE STUDY

A research design is an arrangement of conditions for the collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. In fact, research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data (Sellitz et al, 1976)

Thus, research design provides an outline of what the researcher is going to do in terms of framing the hypothesis, its operational implications and the final data analysis. The descriptive research design has been employed in the present study.

3.5. POPULATION OF SHARE BROKERS FOR THE STUDY

The total number of share brokers as on March 2010 was 8,804 including 4,197 corporate share brokers, 4,317 individual share brokers and the remaining 290 partnership brokers. Among the independent share brokers 147 have registered in the BSE, 87 in Coimbatore stock exchange and 68 in the National Stock exchanges. The total number of sub-share brokers during the period was 75,376 and among them 33,710 have registered in BSE 40,600 in NSE and 20 in CSX.
Table 3.5. Population of Share Brokers

<table>
<thead>
<tr>
<th>Exchange</th>
<th>Individual Share Brokers</th>
<th>Partnership Share Brokers</th>
<th>Corporate Share Brokers</th>
<th>Sub-Brokers</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSE</td>
<td>147</td>
<td>30</td>
<td>826</td>
<td>33,710</td>
</tr>
<tr>
<td>NSE</td>
<td>68</td>
<td>67</td>
<td>1175</td>
<td>40,600</td>
</tr>
<tr>
<td>CSX</td>
<td>87</td>
<td>-</td>
<td>48</td>
<td>20</td>
</tr>
<tr>
<td>Others</td>
<td>4015</td>
<td>193</td>
<td>2148</td>
<td>1046</td>
</tr>
<tr>
<td>Total</td>
<td>4317</td>
<td>290</td>
<td>4197</td>
<td>75,376</td>
</tr>
</tbody>
</table>

Source: SEBI Annual Report 2010

3.6. SAMPLE POPULATION OF SHARE BROKERS.

The study considered only the individual share brokers and the sub-brokers, and so the sample population of the study is 79,693. The corporate and partnership share brokers are not considered for the study; for the reason, that the sub-brokers are the representatives of the corporate as well as the partnership brokers as they are associated with the corporate and partnership brokers. There are 462 share brokers in Coimbatore District and they form the sample population for the study.

3.7. SAMPLING PROCEDURE FOR CHOOSING SHARE BROKERS

The sample population for the study has been limited by region. There are 155 registered share brokers in the Coimbatore Stock Exchange as per the SEBI records. There are 307 share brokers registered in other exchanges and have their offices within Coimbatore district. Hence the total number of share brokers in Coimbatore district is 462. Out of these, five are not operating. So the remaining 457 share brokers form the sample population for the study. Out of these, 150 have been chosen by a simple random method for the study.
Sample size of the share brokers is derived as follow:

\[
n = \frac{N}{1+N(e^2)}
\]

\(n\) = Sample size
\(N\) = Population Size
\(e\) = is the level of precision

\[
\frac{457}{1+457(0.08125)^2} = 151.184 \quad n=150
\]

3.8. POPULATION OF INVESTORS FOR THE STUDY

The total population in Coimbatore District as per 2010-11 census is 3,472,578, and out of these 2,137,502 are the eligible investors who are above 18 years. The study considered all the share market investors who are having account with the share brokers.

3.9. SAMPLE SIZE OF INVESTORS

The research has been carried out in Coimbatore District and the investors were selected from the chosen share brokers list of investors. Three investors had been chosen, by applying simple random sampling method, from the list of registered investors with the share brokers. The total sample size is \(3 \times 150 = 450\).
Sample Size of the investors is calculated as follows:

$$ss = \frac{Z^2 \times (p) \times (1-p)}{c^2}$$

Where:

- \(ss\) = Sample Size
- \(Z\) = \(Z\) value (1.96 for 95% confidence level)
- \(p\) = percentage picking a choice, expressed as decimal (.5 used for sample size needed)
- \(c\) = confidence interval, expressed as decimal (.05 = ±5)

Sample size for the investors is derives as follows:

\(Z\) Value is 1.96 ie 95% Confidence level
\(P = 0.5\)
\(C = 0.04620\)

$$ss = \frac{1.96^2 \times 0.5 \times 0.5}{0.04620^2} = \frac{0.96040}{0.04620^2} = 450.0468 \quad ss = 450$$

3.10. SAMPLE SIZE OF THE STUDY

The data and information have been collected from 150 share brokers and 450 share market investors.

3.11. PERIOD OF STUDY

The data and information collected from the share brokers and investors are pertaining to the year 2009-2011.
3.12. STATISTICAL TECHNIQUES

3.12.1. Descriptive Statistics

In order to understand the socio-economic characteristics of share brokers and investors, trading particulars of share brokers, satisfaction and recommendations by investors, the descriptive statistics is used.

3.12.2. Weighted Mean Score

The service quality dimensions, satisfaction and customer relationship are analyzed by calculating the weighted mean, and the formula is given by,

\[
\text{Weighted Average} = \frac{\sum xf}{\sum f}
\]

Where,

\(x\) = Score of attributes

\(f\) = Frequency

3.12.3. T-Test

In order to study the difference between service rating and recommendation by investors, t-test has been applied and the formula is given by,

\[
T^2 = \frac{n_1n_2}{n_1 + n_2} (\bar{x}_1 - \bar{x}_2)/S_{pooled}^{-1}(\bar{x}_1 - \bar{x}_2).
\]

3.12.4. Analysis of Variance (ANOVA)

To study the age, annual income, total annual family income, monthly business and family size of share brokers and investors, the analysis of variance (ANOVA) has been employed which is given by the formula,

\[F = \frac{\text{Variance between Samples}}{\text{Variance within Samples}}\]

i.e. \(F = \frac{\text{Greater variance}}{\text{Smaller variance}}\)
3.12. 5. Chi Square Test

In order to study the differences in both socio-economic characteristics of share brokers and investors, service of share brokers and recommendations by investors, the Chi-Square Test has been employed and the formula is:

$$\chi^2 = \sum \left( \frac{(O-E)^2}{E} \right)$$

Where,

O = Observed Frequency in each category
E = Expected Frequency in the corresponding category
df. = Degree of Freedom (c-1) (r-1)
$\chi^2$ = Chi Square

3.12.6. Correlation Analysis

To study the relationship between locus of control, investor expertise and experience, risk propensity, confidence, satisfaction and behavioral intentions, the Person’s Correlation Coefficient has been worked out. The formula for Person’s Correlation Co-efficient(r) is as follows,

$$r = \frac{\sum_{i=1}^{N} XY - (\sum_{i=1}^{N} X)(\sum_{i=1}^{N} Y)}{\sqrt{\sum_{i=1}^{N} X^2 - (\sum_{i=1}^{N} X)^2} \cdot \sqrt{\sum_{i=1}^{N} Y^2 - (\sum_{i=1}^{N} Y)^2}}$$

Where,

N represents the number of pairs of data.
\sum denotes the summation of the items indicated.
\sum X denotes the sum of all X scores.
\sum X^2 indicates that each X score should be squared and those squares are then summed.
\[(\sum X)^2\] indicates that the \( X \) scores should be summed and the total is squared.

\[\sum Y\] denotes the sum of all \( y \)-scores.

\[\sum Y^2\] indicates that each \( Y \) score should be squared and those squares are then summed.

\[(\sum Y)^2\] indicates that the \( Y \) scores should be summed and the total is squared.

\[\sum XY\] indicates that each \( X \) score should be multiplied by its corresponding \( Y \) score first and then the product \((XY)\) is summed.

### 3.12.7. Multiple Regression

To assess the influence of investment behaviour on average monthly transactions of investors, the multiple linear regression analysis by Ordinary Least Square (OLS) estimation has been applied. The functional form of multiple linear regression model is given below:

\[ Y = \alpha + \beta_i X_i + e_i \]

Where,

\( Y \) = Dependent Variable- Average Monthly Transaction of Investors

\( X_i \) = Independent Variable-Investment Behaviours

\( i = 1 \) to \( n \)

\( \alpha \) = Intercept

\( \beta_i \) = Partial Regression Coefficients

\( e_i \) = Random Error or Stochastic Disturbance Term

The \( \alpha \) and \( \beta_i \) are the coefficients which are to be calculated by the Ordinary Least Square (OLS) estimation.
3.12.8. Factor Analysis

Factor analysis is a statistical procedure used to uncover relationships among many variables. This allows numerous inter correlated variables to be condensed into fewer dimensions, called factors. In order to measure the satisfaction of services provided by share brokers and the services received by the investors, the factor analysis has been employed with principal component extraction with varimax rotation. To assess the internal consistency of the scale, “Coefficient of Internal Consistency (Cronbach Alpha) has also been computed.

The factor analysis can be expressed as:

\[ Z_{ij} = a_1 f_{1j} + a_2 f_{2j} + \ldots + a_m f_{mj} + e_{ij} \]

Whereas,
- \( Z \) = Satisfaction level
- \( a \) = Factor Loadings
- \( f \) = Factor Score
- \( e \) = Residual term accounting for Errors or other Source of Variation.

The Cronbach alpha is computed as

\[ \alpha = \frac{K}{K - 1} \left( 1 - \frac{\sum_{i=1}^{K} \sigma_{Y_i}^2}{\sigma_X^2} \right) \]

Where
- \( \alpha \) = Cronbach Alpha
- \( K \) = Number of components (K-items or test lets)
- \( \sigma_X^2 \) = Variance of the Observed Total Test Scores for the Current Sample
- \( \sigma_{Y_i}^2 \) = Variance of Component \( i \) for the Current Sample
3.12.9. Service Quality Dimensions

In order to identify the service quality dimensions provided by the share brokers and perception of investors on service quality dimensions, the (SERVQUAL) model has been employed. The measure of service quality may have questions that assess the attributes of tangibles, reliability, responsiveness, assurance, empathy and competence.

3.12.10. Discriminant Analysis

To discriminate the association with the present share brokers and customer base based on customer relationships, the discriminant analysis has been employed and the functional form of it is given by

\[ D = b_1 X_1 + b_2 X_2 + \ldots + b_n X_n + c \]

Where,

\[ D \] = Discriminant (dependent) Variable (Association with Share Brokers/Customer Base)

\[ X_i \] = Discriminating (independent) Variables (Customer Relationship)

\[ b_i \] = Discriminant coefficients

\[ c \] = Constant

3.12.11. Garrett’s Ranking Technique

In order to identify the strength, weakness, opportunities and threats of the share brokers, strategies and problems faced by the share brokers, benefits of share brokers, problems faced by the investors, the Garrett’s Ranking Technique is used. As per this method, respondents have been asked to assign the rank for all the factors and the outcome of such ranking have been converted into a score value with the help of the following formula:
Percent Position = 100 (R_{ij} - 0.5) / N_j

Where,

R_{ij} = Rank given for the i^{th} factor by the j^{th} respondent

N_j = Number of factors ranked by the j^{th} respondent.

3.13. LIMITATIONS OF THE STUDY

1. The present study is based on the primary data collected from the share brokers and the investors. Hence, the drawbacks and limitations of the field level survey may be applicable to the present research.

2. The data and information collected from the consumers are subject to recall bias which may vary.

3. The investor’s and share broker’s preconceived ideas may not be predicted.

4. As the stock market movement is volatility in nature, the investor’s satisfaction level, share broker relationship management, and the service quality opinions may vary frequently.

5. The research is limited to Coimbatore District.