CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

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

3.2 SELECTION OF STUDY AREA - CHENNAI

The establishment of OEMs such as M/s Royal Enfield, Ashok Leyland and Standard Motor Company in 50’s and TVS group of (Tier-1) Companies in the early 60’s in and around Chennai in the state of Tamil Nadu, India had provided the impetus for starting of a large number of ancillary / components manufacturing units (Tier-2 and Tier-3) in this region to cater to the component requirements of the above units and other related industries. It follows that the automotive component manufacturing cluster at Chennai is primarily linked to the establishment of the large automotive industries like Ashok Leyland, TVS Group, Rane Group and Amalgamation group of companies. Initially, it started with the establishment of few units and then gradually expanded in keeping with the level of sophistication and product range of the large automotive manufacturing units. It is no surprise, therefore that today Chennai is popularly known as the hub of automotive industry and also known as the Detroit of India.
Chennai has been in the forefront of producing a large pool of intellectual workforce along with trained and hard working industrial labour for many decades. State’s power deficit has been negligible till very recently. After a brief spell of bad power position, the state is limping back to normalcy and the power tariffs are 15-20 per cent lower than the other major states in India. Chennai’s economy is well balanced with the growth of Information Technology, Industrial, Entertainment and other service sector establishments playing equal role in the city's growth.

Presently, Chennai is home to world-class automotive giants like Ford, Hyundai, Hindustan Motors, Ashok Leyland, Royal Enfield, TAFE (Tractor And Farm Equipment) and TVS Motors. Chennai is located in the northernmost part of Tamil Nadu. Hence, the Chennai port and Chennai International Airport act as the gateways to a substantial portion of southern India comprising Karnataka, Tamil Nadu, Andhra Pradesh and Kerala, which have emerged as the fastest growing states in the post liberalisation era.

3.3 DESIGN OF THE STUDY

The descriptive research design has been employed for the present study, in order to derive the meaningful relationship between different support factors and level of success of business in manufacturing in automotive ancillary industries.

3.4 SAMPLING PROCEDURE

Among the different cities in Tamil Nadu, the Chennai city has been purposely selected for the present study since the cluster of ancillaries are established in and around Chennai. The entrepreneurs engaged in manufacturing in automotive ancillaries have been selected by adopting a random sampling technique.
3.5 PILOT STUDY

Based on the aforesaid identified factors relating to the success of the Entrepreneur, a questionnaire was designed with specific factors / reasons at micro level so that analysis can be made more accurately using various basic and standard Statistical Techniques. This questionnaire (Appendix 1) was pilot tested using random sampling technique by circulation among 60 Entrepreneurs in Chennai. 24 Entrepreneurs had responded that works out to 40 per cent. The results of pilot test were evaluated by using Cronbach’s alpha for the items of each construct and the results show acceptable level of internal consistency. With this outcome, the study has been further pursued by circulation of the above questionnaire to 1000 Entrepreneurs in Chennai, as a Sample Size, and the responses are used as Primary Data herein.

3.6 SAMPLE SIZE

The sample size for the present study is determined by using the following relationship:

\[ n = \frac{t^2 \times p \times (1-p)}{m^2} \]

\( n \) = Required Sample Size
\( t \) = Confidence Level at 95% (standard value of 1.96)
\( p \) = Response from the Entrepreneurs in the Pilot Study
\( m \) = Margin of Error at 5% (standard value of 0.05)

**Step 1:**

\[ n = \frac{(1.96)^2 \times 0.4(1-0.4)}{0.05^2} = 369 \]

**Step 2:** To correct for the difference in the field survey design, the sample size is multiplied by the design effect \((D)\). The design effect is
generally considered to be 1.5 for field survey using random sampling technique.

\[ n \times D = 369 \times 1.5 = 554 \]

**Step 3:** The sample is further increased by 10 % to account for contingencies such as non-response or recording error.

\[ n + 10\% \text{ of } n = 554 + (554 \times 0.10) = 554+55=609. \]

Hence, it is rounded off to 600

Hence, the sample size for the present study is 600 entrepreneurs engaged in automotive ancillary manufacturing industries in Chennai.

### 3.7 PERIOD OF STUDY

The data and information collected from entrepreneurs in manufacturing in automotive ancillary industries pertains to the year 2012-2013.

### 3.8 STATISTICAL TECHNIQUES

#### 3.8.1 Descriptive Statistics

In order to understand the socio-demographics and source of finance for entrepreneurs in manufacturing in automotive ancillary industries, the percentage analysis and frequency distribution are worked out.

#### 3.8.2 Analysis of Variance (ANOVA)

In order to study the difference among the reasons for starting own business in manufacturing in automotive ancillary industries, difference among the tendencies of entrepreneurs for success of business, the association between socio-demographics and tendencies for success of business,
difference among the personal attitudes for success of business of entrepreneurs, difference among the competencies for success of business of entrepreneurs and difference among the factors contributing to the success of entrepreneurs, the Analysis of Variance (ANOVA) has been employed and the expression is:

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

i.e. \[ F = \frac{\text{Greater variance}}{\text{Smaller variance}} \]

### 3.8.3 Correlation Analysis

In order to study relationship between level of success and factors contributing to the success of entrepreneurs in manufacturing in automotive ancillary industries, the Person’s correlation coefficient is worked out. The expression for Person’s Correlation Co-efficient (r) is:

\[
\rho = \frac{\sum XY}{\sqrt{\left(\frac{\sum X^2}{N}\right) - \left(\frac{\sum X}{N}\right)^2}} \times \frac{\sqrt{\left(\frac{\sum Y^2}{N}\right) - \left(\frac{\sum Y}{N}\right)^2}}
\]

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 then those squares summed
- \( (\sum X)^2 \) indicates that the X scores should be summed and the total squared. [To elaborate, \( \sum X^2 \)(the sum of the X squared scores) not to be confused with \( (\sum X)^2 \) the square of the sum of the X scores]
\[\sum Y\] denotes the sum of all Y-scores

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

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

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

### 3.8.4 Multiple Regressions

In order to study the influence of factors contributing to the success of entrepreneurs on level of success of business in manufacturing in automotive ancillary industries, the multiple regression analysis has been employed. The functional form of multiple linear regression models is given below:

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

where

\[Y\] = Dependent Variable - Level of Success of Business

\[X_i\] = Independent Variable - Factors Contributing to the Success of Entrepreneurs

\[i = 1\text{ to } n\]

\[\alpha\] = 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 estimated.
3.8.5 Path Analysis

In order to examine the interrelationship between factors contributing to the success of entrepreneurs and level of success of business in manufacturing in automotive ancillary industries, the path analysis has been employed. The conceptual path model is presented in Figure 3.1.

![Figure 3.1 Conceptual Path Model for Level of Success of Business](image)

3.9 RELIABILITY

The reliability for various components of questionnaire was tested through computing Cronbach’s Alpha and the results are presented in Table 3.1.

<table>
<thead>
<tr>
<th>Particulars</th>
<th>No. of Items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reasons for starting own business</td>
<td>13</td>
<td>0.84</td>
</tr>
<tr>
<td>Tendencies for success of business</td>
<td>4</td>
<td>0.70</td>
</tr>
<tr>
<td>Personal attitudes for success business</td>
<td>10</td>
<td>0.79</td>
</tr>
<tr>
<td>Competencies for the success of business</td>
<td>8</td>
<td>0.78</td>
</tr>
<tr>
<td>Technical Support</td>
<td>5</td>
<td>0.74</td>
</tr>
<tr>
<td>Financial Support</td>
<td>5</td>
<td>0.76</td>
</tr>
<tr>
<td>Government Support</td>
<td>5</td>
<td>0.78</td>
</tr>
<tr>
<td>Market Support</td>
<td>5</td>
<td>0.79</td>
</tr>
<tr>
<td>Moral Support</td>
<td>5</td>
<td>0.77</td>
</tr>
<tr>
<td>Network Support</td>
<td>5</td>
<td>0.76</td>
</tr>
<tr>
<td>Social Support</td>
<td>5</td>
<td>0.72</td>
</tr>
<tr>
<td>Man Power Support</td>
<td>5</td>
<td>0.76</td>
</tr>
<tr>
<td>Logistics Support</td>
<td>5</td>
<td>0.74</td>
</tr>
<tr>
<td>Industrial Linkages Support</td>
<td>5</td>
<td>0.78</td>
</tr>
<tr>
<td>Overall</td>
<td>85</td>
<td>0.77</td>
</tr>
</tbody>
</table>

Source: Primary and Computed Data
From Table 3.1, it is clear that the Cronbach’s alpha of the scale for overall questionnaire is 0.77 indicating acceptable level of internal consistency. The Cronbach’s alpha is varying from 0.70 for tendencies for success of business to 0.84 for reasons for starting own business. The results indicate that the various components in the questionnaire are also in the acceptable level of internal consistency.

3.10 LIMITATIONS

The present study is subjected to the following limitations:

1. The present study is carried out in Chennai City only.

2. The present study is based on the primary data collected from the entrepreneurs.

3. Hence, the drawbacks and limitations of the field level survey are very much applicable to the present research.

4. The data and information collected from the entrepreneurs in manufacturing in automotive ancillary industries are subjected to recall bias.

5. Statutory Data or Data authenticated by Government in different areas of Automotive Sector are not available in our Country.