CHAPTER 2
CHAPTER 2
METHODOLOGY

2.1 INTRODUCTION

This chapter contains the methodology adopted in collection and analysis of the data for the study. The scope of the study, sources of data, procedure followed for selection of the sample, the population size, classification of the sample and various concepts are elaborated in the following paragraphs. The chapter also discusses the techniques used for determining the composite profitability of a firm, the analysis and interpretations of profitability of the total sample as well as the variables. The hypotheses to be tested have also been discussed in this chapter.

2.2 SCOPE OF THE STUDY

2.2.1 The present study includes the analysis of profitability in the corporate sector of Eastern India. The scope of profitability is very wide and broad based. For the theoretical understanding, the first part of the study is confined to the socio-economic backdrop of Eastern India and the review of literature relating to various aspects of profitability. For the analytical and technical study, the second part is relevant. Part two deals with determination of composite profitability of a firm, and analysis of overall trend and pattern of profitability of the total sample
companies. It also contains the variable-wise analysis of the trend and pattern of profitability of the sample companies.

2.2.2 The present study has analysed only the commercial or accounting profitability, and the analysis of social and value-added profitability is beyond the scope of this study. Further, this study has analysed the profitability of 100 non-government non-financial public limited companies having either registered office or head office in Eastern India.

2.2.3 The period of study has been confined to one decade, i.e., 1984-85 to 1993-94. This period includes one major five year plan, i.e., Seventh Five Year Plan (1985-90), two Annual Plans (1990-91, 1991-92), first two years of the Eighth Five Year Plan (1992-94), and the last year of the Sixth Five Year Plan (1984-85). The year 1984-85 was adopted as the base year for the purpose of projections for the Seventh Five Year Plan. Further, the year 1984-85 was treated as a normal year for the major economic activities. In order to treat the same year as the base year for analysing the trends in the profitability of our sample companies, we have selected the year 1984-85 as the beginning of the study period. The study is confined to 1993-94. It is mainly due to the time lag of six months to one year between publication and submission of annual accounts by the listed companies to their respective stock exchanges. After the annual accounts are received, 'The Stock Exchange, Mumbai' processes them for a uniform presentation through its official directory. As a result, by the time we started our analysis, data up to 1993-94 were available in these directories. So, we
have taken the year 1993-94 as the concluding year of our study period.

2.3 SOURCES OF DATA

The data required for the purpose of the study are of the following nature:

(a) Annual consolidated financial statements of the R.B.I. sample companies from 1984-85 to 1993-94,

(b) Annual published financial statements of our sample companies from 1984-85 to 1993-94, and

(c) Information relating to the nature of industrial activities, size and age of our sample companies.

The data relating to the annual consolidated financial statements of the R.B.I. sample companies have been collected from various issues of the R.B.I. monthly bulletins. But, the information relating to the nature of industrial activities, size and age of our sample companies as well as their annual financial statements have been collected from the Stock Exchange Official Directory, Mumbai. Our study includes only the public limited companies in the private sector in Eastern India which are registered in the recognised stock exchanges of India.

2.4 SELECTION OF SAMPLE

2.4.1 Keeping in view the scope of the study, it was decided to include all the non-financial public limited companies in
the private sector which are registered and working in the states of Assam, Bihar, Orissa and West Bengal during 1984-85 to 1993-94 and have listed themselves in any of the stock exchanges in India. Thus, the study includes non-financial public limited companies listed in the stock exchanges, registered and working in the Eastern region (Assam, Bihar, Orissa and West Bengal). As on 31st March, 1984, the beginning of the study period, there were 2,775 such companies in the whole of Eastern region of which 2,683 were only in Assam, Bihar, Orissa and West Bengal. As on the same date, there were 12,523 non-government public limited companies registered and working in India out of which 3,506 were listed in the stock exchanges of India. This constituted about 28% of the total public limited companies in the private sector. Out of the listed companies, 491 were found to be working in the Eastern region having their registered office in the same region. Thus, these 491 companies formed the universe for the study.

2.4.2 On a further scrutiny of these companies, the list had to be shortened because complete data for the entire period of study could not be procured due to non-submission of statements or non-working of a company in a particular year, etc. Further, companies liquidated during the period of study are excluded from the sample list.

2.4.3 Only 98 companies were found to be existing in the official directory having continuous and uniform data throughout the period of study. However, 2 more companies having their Head office in the Eastern region were also
purposefully included to make the size of sample equal to 100. Thus, out of the total listed companies of the Eastern region, 100 samples were chosen. As such the sample constituted more than 20% of total companies listed in the Stock Exchanges and more than 3.6% of the total companies at work in the Eastern region as on 31st March, 1984. These sample companies with a total paid-up capital of Rs. 506 crore as on 31st March, 1984, accounted for 42.7% of the total paid-up capital of non-government public limited companies at work on 31st March, 1984, in the whole of Eastern region and 9.89% of the paid-up capital of the total non-government public limited companies at work in India at that time. Hence, the sample can be taken as representative of the entire organised private corporate sector in Eastern India in terms of number of companies as well as paid-up capital.

2.5 CLASSIFICATION OF THE SAMPLE

The sample companies have been classified into different groups on the basis of industrial activities, size and age of the companies for the purpose of group-wise analysis. It is necessary to classify the companies into different groups because the trends and patterns of profitability differ from one group to another. Further, the classification of total sample companies into different groups gives an overall idea on the coverage of the sample.

2.5.1 CLASSIFICATION BASED ON INDUSTRY

In the financial statement analysis literature, the
typical assumption is that an industry is a set of products which are "reasonably homogeneous with respect to end product". Our classification of the sample companies into different industry-groups is as per the information about the end-product given in the Stock Exchange Official Directory, Mumbai, which is consistent with this end product definition of an industry. Accordingly, the sample companies have been classified into 15 major industry-groups. The number of companies included in the different industry-groups and the relative importance of the different industry-groups in terms of Gross Total Assets as on 31.3.94 are depicted in Table 2.1.

TABLE 2.1

INDUSTRY GROUP-WISE CLASSIFICATION OF SAMPLE COMPANIES

<table>
<thead>
<tr>
<th>INDUSTRY-GROUPS</th>
<th>NUMBER OF COMPANIES</th>
<th>GROSS TOTAL ASSETS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>RS. LAKH</td>
</tr>
<tr>
<td>1. ALUMINIUM</td>
<td>2</td>
<td>125903</td>
</tr>
<tr>
<td>2. CEMENT</td>
<td>4</td>
<td>165179</td>
</tr>
<tr>
<td>3. CHEMICALS</td>
<td>10</td>
<td>194478</td>
</tr>
<tr>
<td>4. COTTON TEXTILES</td>
<td>3</td>
<td>92588</td>
</tr>
<tr>
<td>5. ELECTRICITY GENERATION AND SUPPLY</td>
<td>2</td>
<td>341146</td>
</tr>
<tr>
<td>6. ELECTRO-ELECTRICAL EQUIPMENTS AND CABLES</td>
<td>7</td>
<td>114475</td>
</tr>
<tr>
<td>7. GENERAL ENGINEERING</td>
<td>11</td>
<td>307397</td>
</tr>
<tr>
<td>8. JUTE TEXTILES</td>
<td>5</td>
<td>27384</td>
</tr>
<tr>
<td>9. METALS AND METAL PRODUCTS (OTHER THAN ALUMINIUM)</td>
<td>11</td>
<td>182371</td>
</tr>
<tr>
<td>10. PAPER AND PAPER PRODUCTS</td>
<td>3</td>
<td>188061</td>
</tr>
<tr>
<td>11. RUBBER AND RUBBER PRODUCTS</td>
<td>2</td>
<td>189839</td>
</tr>
<tr>
<td>12. SUGAR</td>
<td>3</td>
<td>30344</td>
</tr>
<tr>
<td>13. SYNTHETICS</td>
<td>2</td>
<td>80645</td>
</tr>
<tr>
<td>14. TEA PLANTATIONS</td>
<td>19</td>
<td>255842</td>
</tr>
<tr>
<td>15. MISCELLANEOUS</td>
<td>16</td>
<td>494470</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100</strong></td>
<td><strong>2790122</strong></td>
</tr>
</tbody>
</table>

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Companies belonging to Tea plantations, General engineering, Metals and metal products, and Chemicals form an important constituent of the sample which respectively constitute 19%, 11%, 11% and 10% of the total sample companies. Though the Miscellaneous group companies constitute 16% of the total sample companies, this group has not been considered as an important constituent of the sample because it is a heterogeneous group with respect to end product. Companies belonging to food products (other than Sugar), potteries, tiles and refractories, shipping, tobacco, coal and mining, hotel, trading, and diversified industries have been included under the Miscellaneous group of industries.

2.5.2 CLASSIFICATION BY SIZE

The sample companies have been divided into five size-groups based on their average paid-up capital, which is the simple average of the paid-up capital at the end of the years 1984-85 and 1993-94. These groups are Very small, Small, Medium, Large and Giant, details of which are presented in Table 2.2.

**TABLE 2.2**

<table>
<thead>
<tr>
<th>SIZE-GROUPS</th>
<th>AVERAGE PAID-UP CAPITAL OF INDIVIDUAL COMPANIES</th>
<th>NUMBER OF COMPANIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERY SMALL</td>
<td>Below Rs. 50 lakh</td>
<td>12</td>
</tr>
<tr>
<td>SMALL</td>
<td>Rs. 50 lakh to Rs. 1 crore</td>
<td>10</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>Rs. 1 crore to Rs. 5 crore</td>
<td>35</td>
</tr>
<tr>
<td>LARGE</td>
<td>Rs. 5 crore to Rs. 25 crore</td>
<td>35</td>
</tr>
<tr>
<td>GIANT</td>
<td>Rs. 25 crore and above</td>
<td>8</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>
Companies each having average paid-up capital below Rs. 50 lakh are classified as Very small companies which account for 12% of the sample companies; companies in the Small size-group with average paid-up capital between Rs. 50 lakh and Rs. 1 crore each constitute 10% of the sample; and companies in the Giant size-group each with average paid-up capital of Rs. 25 crore and above account for 8% of the sample companies. The companies categorised as Medium companies are having average paid-up capital between Rs. 1 crore and Rs. 5 crore each, while companies having average paid-up capital between Rs. 5 crore and Rs. 25 crore each are classified as Large companies. Both the Medium and Large size-groups together constitute 70% (each 35%) of the total sample. Thus, companies in the Medium and Large size-groups form an important constituent of the sample.

2.5.3 CLASSIFICATION BY AGE

The total sample companies have been classified into four age-groups: Very old, Old, Moderately old and New companies. Since the study was conducted during the financial year 1995-96, the age of the individual companies has been determined taking into account the calendar year 1994 as the concluding year and the year of incorporation of the company as the birth year. The companies which are at least 10 but less than 25 years old have been classified as New companies; the companies which are at least 25 but less than 50 years old have been classified as Moderately Old companies; the companies which are at least 50 but less than 75 years old have been classified as Old companies; and the companies which are in existence for at
least 75 years, have been classified as Very old companies. Hence, the companies incorporated prior to 1921 are considered as Very old companies, while those incorporated after 1970 are treated as New companies. The companies registered after 1920 but before 1946 are regarded as Old companies; and those incorporated after 1945 but before 1971 are classified as Moderately old companies. The number of companies included in different age-groups and the relative importance of the different age-groups in terms of gross total assets as on 31.3.94 are depicted in Table 2.3.

TABLE 2.3

CLASSIFICATION OF SAMPLE COMPANIES BY AGE-GROUPS

<table>
<thead>
<tr>
<th>AGE-GROUPS</th>
<th>YEAR OF INCORPORATION</th>
<th>NUMBER OF COMPANIES</th>
<th>GROSS TOTAL ASSETS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rs. lakh</td>
</tr>
<tr>
<td>VERY OLD</td>
<td>Prior to 1921</td>
<td>24</td>
<td>605030</td>
</tr>
<tr>
<td>OLD</td>
<td>1921 to 1945</td>
<td>25</td>
<td>890449</td>
</tr>
<tr>
<td>MODERATELY OLD</td>
<td>1946 to 1970</td>
<td>27</td>
<td>689969</td>
</tr>
<tr>
<td>NEW</td>
<td>After 1970</td>
<td>24</td>
<td>604674</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>100</td>
<td>2790122</td>
</tr>
</tbody>
</table>

The companies in the highest and lowest age-groups (Very old and New) each constitutes 24% of the total sample companies whereas the Old and Moderately old companies comprise 25% and 27%, respectively.

2.6 CONCEPTS

The various concepts used in this study are as follows:

2.6.1 NET SALES

Net sales taken up in this study has been derived by
deducting sales return, allowances and discount from the gross amount received from sales.

2.6.2 COST OF GOODS SOLD

Cost of goods sold in the present study has been calculated by adding inventory at the beginning, purchases, direct wages and other manufacturing expenses excluding depreciation; and deducting inventory at the closing.

2.6.3 COST OF SALES

Cost of sales in the present study has been calculated by adding inventory at the beginning, purchases, direct wages and other manufacturing expenses including depreciation; and deducting inventory at the closing.

2.6.4 GROSS CONTRIBUTION (GC)

Gross contribution is defined as the excess of net sales over cost of goods sold.

2.6.5 GROSS PROFIT (GP)

The excess of the net sales proceeds over the cost of sales has been taken as GP.

2.6.6 GENERAL EXPENSES

General expenses include expenditure other than on goods and their production, i.e., the sum of office and administration expenses, selling and distribution expenses, and other indirect expenses.
2.6.7 OPERATING PROFIT (OP)

Gross profit less general expenses has been taken as OP.

2.6.8 NON-OPERATING SURPLUS OR DEFICIT

Non-operating surplus/deficit taken in this study is the net effect of operations not incidental to the usual course of business, such as, profit or loss on sale of investment, interest or dividend received, donations for charitable purposes, profit or loss on sale of fixed assets, loss due to flood or fire or earthquake, etc., miscellaneous receipts like transfer fees, excess liability provision written back to surplus, etc.

2.6.9 EARNINGS BEFORE INTEREST AND TAX (EBIT)

EBIT has been arrived by adding or subtracting the non-operating surplus/deficit, as the case may be, to/from OP.

2.6.10 INTEREST

Interest expenses include interest paid on debentures and bonds, and also on the borrowed funds.

2.6.11 PROFIT BEFORE TAX (PBT)

PBT has been arrived at by deducting interest expenses from EBIT.

2.6.12 PROFIT AFTER TAX (PAT) / NET PROFIT (NP)

PAT / NP has been arrived at after deducting the provision
for tax from PBT.

2.6.13 PROFIT DISTRIBUTED

Profit distributed constitutes the profit distributed to preference as well as equity shareholders.

2.6.14 RETAINED EARNINGS

NP / PAT less profit distributed has been taken as retained earnings.

2.6.15 OPERATING CASH FLOW (OCF)

OCF has been taken as the sum of PAT and depreciation provided during the year.

2.6.16 RETAINED CASH FLOW (RCF)

The term RCF has been taken as PAT plus depreciation less dividend paid. In other words, it has been taken as the sum of retained earnings and depreciation provided during that period.

2.6.17 NET PROFIT BEFORE INTEREST (NPBI)

The sum of net profit and interest expenses has been taken as NPBI.

2.6.18 EARNINGS BEFORE DEPRECIATION, INTEREST AND TAX (EBDIT)

The sum of EBIT and depreciation provided for during the year has been treated as EBDIT. It is otherwise called as gross earnings.
2.6.19 TOTAL ASSETS (TA)

The sum of all the assets net of depreciation has been taken as TA.

2.6.20 GROSS TOTAL ASSETS (GTA)

Gross total assets have been taken as the sum of TA, as reported in the balance sheet, and accumulated depreciation, appearing as a deduction from the fixed assets in the balance sheet.

2.6.21 TOTAL TANGIBLE ASSETS (TTA)

The excess of TA over intangible assets has been taken as TTA.

2.6.22 CAPITAL EMPLOYED (CE)

The term CE has been taken as the aggregate of the long term loans, debentures, short term loans and advances, and the shareholders' equity.

2.6.23 GROSS CAPITAL EMPLOYED (GCE)

GCE has been taken as CE plus accumulated depreciation.

2.6.24 SHAREHOLDERS' EQUITY (SHE)

SHE is defined as the total of paid-up capital (ordinary and preference), forfeited shares, and accumulated reserves and surplus adjusted for losses.
2.6.25 TANGIBLE PORTION OF SHAREHOLDERS' EQUITY (TPSHE)

The excess of shareholders' equity over intangible assets has been treated as TPSHE.

2.7 TECHNIQUES OF ANALYSIS

In the present study, an effort has been made to analyse the profitability in the corporate sector of Eastern India with the help of accounting and statistical tools. In the following paragraphs, a brief discussion about these techniques has been made.

2.7.1 RATIO ANALYSIS

We have used mainly the ratio accounting for analysing the profitability. As many as 12 profitability and other related ratios have been used for total sample analysis as well as variable-wise analysis. In this study, we have used the following ratios.

(1) GROSS EARNINGS RATIO

The gross earnings ratio shows the amount left after meeting all the expenses excluding depreciation, interest and tax out of every hundred rupees of the net sales. It indicates the manufacturing efficiency of a company. The determinants of the ratio are earnings before depreciation, interest and tax, and net sales. It is obtained by dividing earnings before depreciation, interest and tax by net sales, and expressed in percentage. The use of earnings before depreciation, interest
and tax is an attempt to eliminate the effect of changing depreciation policy of a firm over years, varying methods of financing the capital employed by different companies, varying opportunities in availing tax incentives, and the taxes which are not controllable by the management. Hence, this ratio will be more effective in cross sectional comparison of the firms.

(2) GROSS PROFIT RATIO

The gross profit ratio shows the average margin obtained on goods and services sold. It reflects the efficiency with which management produces each unit of product. It is the percentage of net sales left after meeting the related product costs, and is extremely useful as an indicator for the cost control and sales promotion. This ratio can become an useful measure of earnings in the undertakings having small investment base or a high turnover resulting into an abnormal high return on the investment. The determinants of the ratio are gross profit and net sales. When this ratio is subtracted from 100, we obtain the cost of sales to net sales ratio.

(3) OPERATING PROFIT RATIO

The operating profit ratio shows the amount left after meeting all the manufacturing and operating expenses out of every hundred rupees of the net sales. It reveals the operational efficiency of a business. In other words, the ratio measures the profitability of the regular buying, selling and manufacturing operations of the company. The operating profit ratio should be sufficiently high to leave a balance for
providing a fair return on the funds invested after the payment of interest and tax. A low operating profit margin is unfavourable because it implies that the company is not in a position to withstand the depressed conditions. Again, the operating profit margin may be apparently satisfactory but the volume of sales may be unsatisfactory in terms of plant capacity. The operating profit divided by net sales, and expressed in percentage gives us the operating profit ratio.

(4) NET PROFIT RATIO

The net profit ratio indicates what portion of net sales is left for the shareholders after all the costs, charges and expenses have been deducted. It is obtained by dividing profit after tax by net sales, and expressed in percentage. It is the ultimate measure of efficiency of the management.

(5) GROSS SURPLUS RATIO

The gross surplus ratio reflects how much the firm has earned on the investment of all the financial resources committed to the firm. The overall profitability of a firm can be appropriately judged by this measure if one considers to eliminate the effect of the different methods firms use in the financing of assets. This ratio is considered to be one of the very effective measures of the management's performance in cost effectiveness and measures how effectively total assets are being utilised by a firm. This ratio takes into account the non-operating income which is fairly substantial in some companies. Therefore, gross surplus ratio is a more precise and
effective measure of the profitability. It reflects the combined effect of both operations and financing activities of a company. It has been defined as the ratio of earnings before depreciation, interest and tax (EBDIT) to gross total assets, and expressed in percentage. The reason for using EBDIT has already been explained earlier. The use of GTA (Gross Total Assets) as the denominator is an attempt to eliminate the effect of different methods firms use in the financing of assets as well as to take care of the effect of depreciation which may change over years. Hence, this ratio will be quite useful in cross sectional comparison of firms. Accordingly, to study the overall profitability by a single measure, we have been prompted to use this ratio in our study. The reason for adopting this ratio as an unbiased measure of overall profitability has also been given in chapter 4 (section 3.7). (Detailed analysis of different aspects of overall profitability follows in chapter 6).

(6) RETURN ON TOTAL TANGIBLE ASSETS

The return on total tangible assets has been defined as the percentage of profit after tax to total tangible assets. The use of total tangible assets is an attempt to eliminate the effect of intangible assets, which may have the least potential sale value. This rate of return shows the productivity of the total tangible assets after meeting all the expenses including taxes.
(7) RETURN ON CAPITAL EMPLOYED

The return on capital employed is one of the most basic profitability ratios. It is a good indicator of the profitability of the capital employed in the firm. The percentage of earnings before interest and tax to capital employed has been taken as the return on capital employed.

(8) CASH FLOW PLOUGHED BACK RATIO

The preservation and increased generation of cash flow is judged by several schools of thought to be one of the primary functions of a business. The cash flow ploughed back analysis goes straight to the heart of any business enterprise and measures its ability to invest in future growth activities. Growth companies are usually characterised with a high retention rates. The cash flow ploughed back ratio provides information about how effectively and efficiently the capital (Owners as well as Outsiders) is being utilised to generate cash for future growth purpose. A high ratio reveals efficient utilisation of capital. The ratio is obtained by dividing retained cash flow by gross capital employed, and expressed in percentage.

(9) RETURN ON SHAREHOLDERS' EQUITY

The owners or shareholders of a company who provide funds to initiate the project and thereafter leave their share of profit to be ploughed back into business for its expansion, are more interested to know how much return on owners' equity their
company is giving or can possibly give in future. The return on shareholders' equity reflects how much the firm has earned on the funds invested by the shareholders either directly or through retained earnings. It is the ratio of after tax profit to shareholders' equity. The ratio is usually expressed in percentage. If this ratio is high it can be said that the results are favourable and if it is low then the results are considered unfavourable.

(10) EQUITY GROWTH RATIO

The equity growth ratio reflects the continued viability of an organisation's growth rate. It assumes that other factors, such as the debt equity ratio, remaining constant, a company's growth rate is directly correlated to its retained earnings. Here, a company's investment policies and dividend pay-out policies are emphasised as vital to the management of growth. It is the ratio of retained earnings to shareholders' equity, and expressed in percentage. A comparison of the return on shareholders' equity and equity growth ratio will throw light on the company's retention policy.

(11) TIMES-INTEREST-EARNED (INTEREST COVERAGE) RATIO

The times-interest-earned ratio indicates the number of times the interest charges are covered by funds that are ordinarily available for their payment. The ratio has been calculated by dividing earnings before depreciation, interest and tax (EBDIT) by interest expenses. Since depreciation is a non-cash item and funds to that extent are available to pay
interest, and taxes are computed after interest; the rate of coverage has been calculated by taking EBDIT as the numerator.

(12) GROSS TOTAL ASSETS TURNOVER RATIO

Investments in the form of different assets help produce and sell goods which generate surplus for achievement of business objectives. The performance activity can be judged by the calculation of assets turnover ratio which indicates the overall efficiency with which the total assets are used. The ratio indicates how many times annual sales cover gross total assets. A high ratio indicates better utilisation of assets and a low ratio depicts under utilisation of assets. This ratio has been obtained by dividing net sales for a given period by gross total assets employed in the business during that period. The use of gross total assets as the denominator is an attempt to eliminate the effect of varying depreciation policy which makes comparison difficult.

2.7.2 MEAN AND COEFFICIENT OF VARIATION

We have also calculated the ten-yearly average (Mean) and coefficient of variation of the profitability ratios for the sake of analysis.

2.7.3 CORRELATION ANALYSIS

The study also uses the coefficient of correlation to find out the existence of any relationship between the variables. To examine the inter-industry relationship of profitability for the industries covered under this study, we have computed
product moment coefficient of correlation and presented in a matrix form. We have also found out product moment coefficient of correlation between sales and gross profit of the total sample companies to test whether the gross profit margin remains constant over the years or not. To study the degree of relationship between different profitability ratios, we have computed the rank coefficient of correlation. The purpose of finding out the degree of relationship between two profitability ratios is to shortlist the large number of profitability ratios. This will help us to study the composite profitability with the help of a least number of ratios. In order to study whether the overall profitability series of a firm follows a systematic pattern, we have examined the autocorrelations (up to lag 3) for the first differences series of the gross surplus ratio.

2.7.4 GROWTH RATES

To study the growth of overall profitability in the corporate sector, we have computed the compound annual growth rate (CAGR). But, to study the general trend of different profitability ratios, we have calculated the constant annual growth rate (AGR) under ordinary least square (OLS) approach.

2.7.5 AVERAGE DEVIATION AND COEFFICIENT OF AVERAGE DEVIATION

In order to study the convergence of overall profitability of some industries over a period of time, we have calculated the average deviation and coefficient of average deviation of the most profitable and the least profitable industries from
median profitability of the corporate sector.

2.7.6 SIMPLE AND MULTIPLE REGRESSION ANALYSIS

In order to study whether the corporate sector's mean profitability ratios can be perceived as the target ratios by the industries, we have taken the help of simple regression analysis. Further, to study the extent to which industry factors affect an individual firm's profitability, we have also used simple regression analysis. The stepwise multiple regression technique has been used to study the impact of selected financial ratios on the gross surplus ratio.

2.7.7 RUNS TEST

We have also used runs test to examine if the signs of successive changes in profitability ratio are independent, i.e., the profitability series does not follow a systematic pattern.

2.7.8 OTHER STATISTICAL TECHNIQUES

Lastly, a number of tests of significance, viz., t, z, F, Chi-square tests, etc., have been applied to test our hypotheses, as and where applicable.

2.8 HYPOTHESES OF THE STUDY

The study broadly aims at examining the following hypotheses with the available data and techniques. However, the testing of hypotheses is confined only to the region and the sample for which the study is confined to. The hypotheses are
2.8.1 The gross profit margin remains constant over the years.

2.8.2 The nature of the business, size and age of a firm have no bearing on its profitability.

2.8.3 The corporate sector's mean profitability ratios are perceived as the target ratios by the industries.

2.8.4 A firm's profitability could be well described as a random-walk model.

2.8.5 The industry-wide factors are important factors affecting an individual firm's profitability.

2.8.6 Increase/decrease in gross earnings ratio, gross block turnover ratio, total assets turnover ratio, inventory turnover ratio and working capital turnover ratio individually/jointly result in increased/decreased gross surplus ratio.