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3.1 Introduction

This chapter deals with the universe of the study, selection of the samples, techniques of data collection and the statistical tools used in analyzing the data. This chapter explains the methodology used and presents the sample selection, sample size, period of the study, contents of the tables, sources of collecting data and then discusses the data analysis tools which are used in this study. This research tries to identify by the financial accounting systems in India.

3.2 Meaning of research methodology

The word research is composed of two syllables, re and search. Re is a prefix meaning again, anew or over again. Search is a verb meaning to examine closely and carefully, to test and try, or to prob. Together they form a noun describing a careful, systematic, patient study and investigation in some field of knowledge, undertaken to establish facts or principles. The Advanced Learner’s Dictionary of Current English lays down the meaning of research as “a careful investigation or inquiry especially through search for new facts in any branch of knowledge”.¹

Research design means to prepare detailed plan and procedures for the conduct of the research project.

It is the basic plan that guides researcher in the execution of the research project undertaken. It is like road map which enables the researcher to conduct various activities for the completion of research project. In short, research design is a systematic planning, organizing and executing a research project within specified time and resource allocation. Research design tells the
type of data to be collected, the sources of data and the procedures to be followed in data collection. Research design provides suitable framework that guides the collection and analysis of data.

Research is a structured that utilizes acceptable scientific methodology to solve problems and create new knowledge that is generally applicable.

3.3 Importance of the study

In fact historical information is not useful during an inflationary period and management will receive figures that are inaccurate and irrelevant; the cost of production will be understated, profits will be overstated, and the distributed profit will be drawn from capital. The researcher will study a suitable system of inflation accounting for use in Steel Authority of India Limited (SAIL) to facilitate better planning and more effective control under inflationary conditions. The importance of this research lies in the fact that the India government has decided to keep the profitable enterprises in the public sector. Thus they need a measurement procedure to determine profits, i.e.; on the basis of current cost, not historical cost accounting.

Therefore, the study has the following objectives:

1. To study and evaluate the existing inflation accounting Methods and other regulations imposed by different interested bodies. This will be done by tracing events in the real world and developments in the theory of inflation accounting.

2. To study and evaluate the current method and primary aims of financial reporting in India and the primary aims of these reports, and examine the need for improvement.
These matters will be viewed in the context of the major historical events that have affected the practice and development of accounting in India.

3. Finally recommendation will be made for improving inflation accounting in steel companies.

3.4 Statement of the problem

Before proceeding to explain how financial information intended as a response to the effects of changing prices could be prepared in a number of ways, it is proposed to discuss the limitations of conventional historical accounting. These limitations include:

1. Reported results may be distorted as a result of the matching of current revenues with costs incurred at an earlier date.

2. The amounts reported in a balance sheet in respect of assets may not be realistic, up-to-date measures of the resources employed in the business.

3. As a result of (1) and (2), calculation to measure return on capital employed may be misleading.

4. Because holding gains or losses attributable to price level changes are not identified, management’s effectiveness in achieving operating results may be concealed.

5. There is no recognition of the loss that arises through holding assets of fixed monetary value and the gain that arises through holding liabilities of fixed monetary value.

6. A misleading impression of the trend of performance over time may be given because no account is taken of changes in the real value of money. (ICAEW, 1988)[2]
Because of these limitations, it has become widely recognized that historical cost accounts alone are unsatisfactory for different users in times of changing prices.

The main problem with historical cost valuation of assets shows up if there is a large change in the price of the asset (due to general inflation for example) from the time of its purchase to the end of the current accounting period: the historical cost valuation may bear no resemblance at all to a current market valuation for the asset. Thus in an inflationary situation, historical cost depreciation allowance will be understated, income will be overstated and income taxes may become capital taxes\[^3\]. The problem is that historical cost accounting implicitly assumes that monetary values the end of an accounting period is comparable to monetary values at the beginning of the accounting period; i.e., there is an implicit assumption of price level stability.\[^4\]

Inflation accounting is an accounting practice in which values are adjusted for inflation. This is done to provide a more accurate picture of a financial situation. In some nations, this type of accounting is required for companies which make public financial reports if they are above a certain size and smaller companies may utilize inflation accounting as well. This technique requires some careful accounting work because it is possible to muddy the financial picture with inflation accounting. Also with inflation accounting, the accountant takes the actual value and adjusts it for inflation. This practice may also be known as price level accounting, and it can be very revealing; In fact most studies of inflation accounting have concentrated on published accounts and little attention has been paid to the information problem in management accounts. Lund .B. (1974) has emphasized the kind of
information needed by managers to measure the effects of information not only on profitability and shareholders’ funds, but on planning, budgets, and control. As information has serious effects on external reporting, it also affects internal reporting for measuring profit and leads to wrong decisions.\textsuperscript{[5]} The distortions may be worse in internal reports than in external reports. Allardyce F. says:

The same distortion that can give false comfort in reporting financial results to the public can also lead to internal complacency in judging the performance of operating units worse yet; it can lead to wrong decisions. (Allardyce, 1983)\textsuperscript{[6]}. Therefore inflation accounting helps both internal and external users of financial statements and so it is needed to pay more attention to this important matter for calculating the firm’s annual reporting.

3.5 Objectives of the Study

The study is specifically related to steel authority of India limited and more 7 steel companies in India. The researcher after analyzing the financial reports of these companies in India has taken into consideration the following objectives:

1. To study the impact of inflation accounting on financial statements and changing prices.

2. To study and analyses the balance sheet, profit and loss account as per inflation accounting and historical cost accounting.

3. To understand the most important difference between historical cost accounting and inflation cost accounting.
4. To study the methods of preparing financial statements according to inflation accounting.

5. To study the different methods of price level accounting for changing prices.

6. To realize the current value of profit, inventory, assets, monetary and non monetary items, etc.…

7. To study the impact of inflation and the company’s performance measurement.

8. To provide more useful information than that available from historical cost accounting for guidance of management, shareholders and other users.

3.6 Hypotheses Preparation

A hypothesis is a tentative statement that proposes a possible explanation to some phenomenon or event. A useful hypothesis is a testable statement which may include a prediction. In other words, the hypotheses are a powerful tool that can link all to theory and theory to all. Based on what mentioned in this Chapter, the research hypotheses examine the effects of methods of accounting used in steel industries on making decisions relevant to users and performance measurement. In this study, the hypotheses are:

Hypothesis 1:

There is a significant relationship between inflation accounting and performance measurement.
Hypothesis 2:

There are significant differences between financial statements according to historical cost accounting approach and inflation accounting approach.

Hypothesis 3:

Disclosure of financial statements as per inflation accounting helps the users of financial statements in making effective decisions for protection of operating capability of the company.

3.7 Scope of the study

3.7.1 Geographical Scope:

This study has been conducted in steel companies in India.

3.7.2 Time Scope:

The related interval under study for examining the accounting systems and evaluating the performance of the steel companies is 5 fiscal years from 2006-07 to 2010-11 fiscal years. It is hoped that this study will be helpful to the policymakers, investors and company owners in particular of the sample company. Further the study focuses on effects and analysis of inflation accounting and changing prices of financial information of steel authority of India ltd. (SAIL)

3.7.3 Sample selection

A case study is a good way to develop and increase understanding of a complex matter. Hence; a case study research offers the chance of a holistic view. Various aspects are studied in relation to each other and within their context. So the holistic view sees more in the whole than just the sum of its parts. Because of these advantages this strategy is applied in this paper by
using it in a descriptive mode, which illuminates an involvement and its context. The researcher has selected (SAIL) Steel Authority of India Ltd and 7 more steel companies in India for the purpose of collection of primary data because of operational convenience and from the point of time and cost factor. The researcher has chosen SAIL as a main company and used simple random system method for selecting the other companies from from Bombay stock exchange. Steel authority of India Ltd is an accepted company in "A" group from Bombay stock exchange. It is one of the largest industrial entities in India.

3.7.4 Sample size

Larger sample sizes are usually more expensive in every aspect of performing the research. The representativeness of the research findings and their statistical significance will generally increase as the sample size increases, in all but the most exceptional circumstances. At the very least we should have a sample size large enough to allow us to conduct the required tests of the research question, and we should be aware of this minimum requirement at the outset. Issue of sample selection is fundamental to our subsequent choice of research method and the most appropriate form of hypothesis testing.

The statistical population under study is the steel companies in India. 20 steel companies are in India. From among the aforementioned companies SAIL and 7 more steel companies have been selected as sampling companies. All 8 companies are active in Bombay Stock Exchanges (BSE), the statistical sample includes the eight companies as follows:
1. SAIL (Steel authority of India Limited)
2. TATA STEEL
3. BHUSHAN STEEL
4. JSW STEEL
5. JINDAL STEEL
6. ISPAT STEEL
7. VISA STEEL
8. VIZAG STEEL

Table 3.1 sample selected for hypothesis testing

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>First hypothesis test</td>
<td>(SAIL) Steel Authority of India and 7 more steel companies</td>
</tr>
<tr>
<td>Second hypothesis</td>
<td>(SAIL) Steel Authority of India Ltd and 7 more steel companies</td>
</tr>
<tr>
<td>Third hypothesis</td>
<td>(SAIL) Steel Authority of India Ltd and 7 more steel companies</td>
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</tbody>
</table>

3.7.5 Chapter Scheme

Chapter 1: Introduction

This chapter presents an introduction of this study and explains the development of steel companies in India.

Chapter 2: Review of Literature

In this chapter research, theoretical literature about inflation and historical accounting, history of inflation accounting in India, a background of inflation accounting in other countries, review of previous researches have been presented.
Chapter 3: Research Design

This chapter describes the approaches that are used in this study in order to the hypotheses testing under the study, the formula for converting historical figures to inflation accounting of different items and the method which the researcher has used, explains the problems under study, importance, objectives and hypotheses of the study and research methodology including primary and secondary data and at the end of this chapter the limitations of research have been expressed.

Chapter 4: Profile of company

In this chapter a profile, history, place and function of SAIL Company of current research and also other 7 steel companies’ performance and profile from 2006-07 to 2010-11 have been explained.

Chapter 5: Collection of data

In this chapter, calculation of variables, tables and histograms of variables have been presented.

Chapter 6: Analysis of data

In this chapter hypotheses on the basis of statistical methods have been tested and reported. This chapter discussed collection data from case study companies, and also presents the statistical analysis; results of the data analysis and hypotheses testing will be discussed.

Chapter 7: Findings, Conclusions and Suggestions

In this chapter, the findings and necessary suggestions on the basis of findings have been presented. This chapter provides a summary of the key findings of the research and discusses the conclusions of the study and presents the major important finding, conclusion, suggestion and recommendations.
3.8 Research Methodology

3.8.1 Method of data collection

The researcher uses the following methodology:

(A) Primary data collection:

This is first hand information; the researcher has collected primary data through survey, personal interview of executives and questionnaire filled on the basis of interviews.

(B) Secondary data:

This is the published information: the researcher has collected secondary data through steel companies in India, research journals & magazines, annual reports, publications of Bombay stock exchange, references and text books, information published by government department etc, the secondary data also collected through various libraries situated in India particularly, in Pune. The secondary data is mainly selected from:

a) Annual reports of the selected companies

b) Information published by government department, Reserve Bank of India

c) Various libraries situated in India

d) Related books, journals, various articles

e) Internet

And by referring to the Bombay Stock Exchange (BSE) and the available information banks, reserves bank of India, the data were collected in the form of the checklists. The financial statement and capital market data for our research were obtained from publicly available databases maintained by center for monitoring the Indian economy (CMIE).
3.8.2 Data sources of present Study

For collection of data, the researcher has selected the annual reports (balance sheet and profit and loss account) of the companies for 5 years from 2006-7 to 2010-11 that all of them were prepared as per historical cost accounting. Therefore the researcher had to convert these financial statements into inflation accounting. However, in the present case study, the company’s information didn’t have current market values or specific indices available, so that the CCA (Current Cost Accounting) and RCA (Replacement Cost Accounting) are ruled out by lack of data. The researcher therefore chose CPP (Current Purchasing Power) method on grounds of practicality and converted all the figures of balance sheet and profit and loss account from historical basis to current purchasing power. According to CPP, figures of opening and closing balance sheet adjustments were needed and for income statement, depreciation adjustment, cost of goods sold adjustment, gain on borrowing and loss on holding money have been calculated. For the purpose of converting the researcher has used the Wholesale Price Index (WPI) and the index numbers of industrial production that is published by Reserve bank of India (RBI) and Central Statistics Office (CSO), Government of India. After converting, the selected ratios according to hypothesis were calculated for both historical and current purchasing power figures, and then the researcher analyzed and compared them with each other to prove the hypothesis.

3.9 Data analysis

In this study, the information content has been examined using the usual statistical tools like t-test and coefficient correlation.
Coefficient of correlation is used to describe how well one variable
is explained by the other variable. It reveals the magnitude and direction of
relationship. The magnitude is the degree to which variables move in the same
or opposite direction.

The co-efficient signifies the direction of the relationship. t- Statistics
is used for testing the significance of a dependent variable over the
independent variable. There are two methods of testing the relationship with
the help of t-statistics:[7]

1) - To compare the values of t-calculated with that of t-tabulated. In
this case if the calculated t-value is greater than that of table value null
hypothesis has to be rejected and alternative hypothesis has to be accepted.

2) -To compare the p-value with the level of significance:
- If the p-value is greater than or equal to level of significance, the null
hypothesis is accepted.
- If the p-value is less than the level of significance, the null hypothesis
has to be rejected

3.9.1 Hypothesis testing (tests of significance)

Significance testing is used to help make a judgment about a claim by
addressing the question, Can the observed difference be attributed to chance?
We break up significance testing into three (or four) steps:[8]

Step A: Null and alternative hypotheses

The first step of hypothesis testing is to convert the research question
into null and alternative hypotheses. We start with the null hypothesis \(H_0\).
The null hypothesis is a claim of “no difference.” The opposing hypothesis is the alternative hypothesis ($H_1$). The alternative hypothesis is a claim of “a difference in the population,” and is the hypothesis the researcher often hopes to bolster. It is important to keep in mind that the null and alternative hypotheses reference population values, and not observed statistics.

**Step B: Test statistic**

We calculate a test statistic from the data. There are different types of test statistics. This chapter introduces the one-sample $z$-statistics. The $z$ statistic will compare the observed sample mean to an expected population mean $\mu_0$. Large test statistics indicate data are far from expected, providing evidence against the null hypothesis and in favor of the alternative hypothesis.

**Step C: $p$ Value and conclusion**

The test statistic is converted to a conditional probability called a $P$-value. The $P$-value answers the question “If the null hypothesis were true, what is the probability of observing the current data or data that is more extreme?”

Small $p$ values provide evidence against the null hypothesis because they say the observed data are unlikely when the null hypothesis is true. We apply the following conventions:

- When $p$ value $>.10 \rightarrow$ the observed difference is “not significant”
- When $p$ value $\leq .10 \rightarrow$ the observed difference is “marginally significant”
- When $p$ value $\leq .05 \rightarrow$ the observed difference is “significant”
- When $p$ value $\leq .01 \rightarrow$ the observed difference is “highly significant”

Use of “significant” in this context, means “the observed difference is not likely due to chance.” It does not mean of “important” or “meaningful.”

**Step D: Decision (optional)**

Alpha ($\alpha$) is a probability threshold for a decision. If $P \leq \alpha$, we will reject the null hypothesis. Otherwise it will be retained for want of evidence.\[6\]

### 3.10 Definition of variables

#### 3.10.1 Net Profit Ratio (NPR)

The two basic components of the net profit ratio are the net profit and sales. The net profits are obtained after deducting income-tax and, generally, non-operating expenses and incomes are excluded from the net profits for calculating this ratio. Thus, incomes such as interest on investments outside the business, profit on sales of fixed assets and losses on sales of fixed assets, etc are excluded.

Formula:

\[
\text{Net Profit Ratio} = \left( \frac{\text{Net Profit}}{\text{Net Sales}} \right) \times 100
\]

NPR is used to measure the overall profitability and hence it is very useful to proprietors. Thus ratio is very useful as if the net profit is sufficient, the firm shall not be able to achieve a satisfactory return on its investment.

This ratio also indicates the firm's capacity to face adverse economic conditions such as price competition, low demand, etc. Obviously, higher the ratio the better is the profitability. But while interpreting the ratio it should be
kept in mind that the performance of profits also is seen in relation to investments or capital of the firm and not only in relation to sales.

Net Profit Ratio indicates that portion of the sales which is left out with the owners after considering all types of expenses and costs either operating or non operating or normal or abnormal. It is used to measure the overall profitability and hence it is very useful proprietors. It also indicates the firm’s capacity to face adverse economic conditions such as low demand, price competition etc. It is expressed in percentage. A higher net profit ratio will be desirable as it indicates higher profitability of the business.

The NPR is really a short term measurement, because it does not reveal a company’s action to maintain profitability over the long term, as may be indicated by the level of capital investment or research and development expenditures. Also, a company may delay a variety of discretionary expenses, such as maintenance, to make its net profit look better than it normally is. Consequently, you should evaluate the net profit ratio alongside a variety of other merits to gain a full picture of a company’s ability to continue as a going concern.

Another issue with the net profit margin is that a company may intentionally keep it low in accordance with a low-pricing strategy that aims to grab market share in exchange for low profitability. In such cases, it may be a mistake to assume that a company is doing poorly, when in fact it may own the bulk of the market share precisely because of its low margins.

In order to convert NPR under historical to inflation method, all the items of profit and loss account should be converted by the proper index at the end of the year and the average index. In Current Purchasing Power method we
assume that all transactions are occurred during the year so we use average index. [9]

For conversion of net sale is used the following formula:

Net profit from historical cost account \( xx \)

Less:

Stock adjustments \( (xx) \)
Depreciation adjustments \( (xx) \)

Add:

Revenue adjustments \( xx \)

-------------

\( xxx \)

Monetary items gains \( xx \)

-------------

Current purchasing power profit \( xx \)

3.10.2 Operating Ratio (OPR)

Operating net profit ratio is calculated by dividing the operating net profit by sales. This ratio helps in determining the ability of the management in running the business.

Formula:

Operating profit ratio = \( \frac{\text{Operating profit}}{\text{Net sales}} \times 100 \)
Operating profit = Gross profit - Operating Expenses

OR

Operating profit = Net sales - Operating cost

OR

Operating profit= Net sales - (Cost of goods sold + Administrative and office expenses + Selling and distribution exp.)

OR

(Net profit + Non-operating expenses) - (Non-operating incomes)

Higher the ratio, better it is

Operating profit also called EBIT (Earnings before Interest and Tax) shows the relationship between operating profit & the sales. The operating profit is equal to gross profit minus all operating expenses or sales less cost of goods sold and operating expenses.

In other words it measures the operational efficiency of the company and all its operations of production, purchase, inventory, selling and distribution and also has control over the direct and indirect costs. And hence higher ratio is indication of the efficiency of the management of the company.\[10\]

3.10.3 Gross Profit Ratio (GPR)

GPR is the ratio of gross profit to net sales expressed as a percentage. It expressed the relationship between gross profit and net sale.

Net sales mean that sale minus sales returns. Gross profit would be the difference between net sales and cost of goods sold. Cost of goods sold in the
case of trading concern would be equal to opening stock plus purchase, minus closing stock plus all direct expenses relating to purchases.

Formula:

\[ \text{Gross profit ratio} = \left( \frac{\text{Gross Profit}}{\text{Net Sales}} \right) \times 100 \]

Gross profit ratio evaluates the effectiveness of business. It indicates the efficiency of firm in terms of its production and how much it has gained profit. Gross profit reflects the profit firm has made on cost of goods sold. If firm has higher gross profit margin then it is a sign of success because all operating expenses, interest charges and dividends would have to be taken off from GP. If company increase selling price of goods sold and decrease cost of goods sold then this ratio increases. However if company decrease selling price of goods sold and increase cost of goods sold then this ratio decreases.

This ratio is also affected due to critical policies of firm. If management is not capable of improving sales volume then company will suffer from loss. Basically company analyzes GP margin while considering its policies, rises and falls in purchases of products. The GP percentage indicates financial performance of firm. If this percentage is higher than it means that firm has sufficient financial resources to pay for costs necessary to run and grow business. In this way business can be improved. On the other hand if firm has lower gross profit then it means that company has limited financial resources.

The GP percentage reflects recent financial data of firm. This financial data and financial statement is used by analysts to compare profitability between different companies. Those companies which are traded publicly report sales figure to Securities and Exchange Commission (SEC). When
investors compare financial performance of different companies they use sales figure and ratio analysis to assess financial condition of business. The ratio analysis basically depicts the short-term financial condition of firm so more efforts could be made to improve business if in-case firm's financial position is not satisfactory. The company can control costs of it has higher GP margin.\[10\]

### 3.10.4 Return on Investment (ROI)

A performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. To calculate ROI, the benefit (return) of an investment is divided by the cost of the investment; the result is expressed as a percentage or a ratio.

**Formula:**

\[
\text{Return on Investment} = \frac{\text{Net profit}}{\text{total assets}} \times 100
\]

Return on investment, or ROI, is the most common profitability ratio that evaluates the performance of a business. There are several ways to determine ROI, but the most frequently used method is to divide net profit by total assets.

Return on investment isn't necessarily the same as profit. ROI deals with the money you invest in the company and the return you realize on that money based on the net profit of the business. Profit, on the other hand, measures the performance of the business. Don't confuse ROI with the return on the owner's equity. This is an entirely different item as well. Only in sole proprietorships does equity equal the total investment or assets of the business.

You can use ROI in several different ways to gauge the profitability of your business. For instance, you can measure the performance of your pricing
policies, inventory investment, capital equipment investment, and so forth. Some other ways to use ROI within your company are by:

- Dividing net income, interest, and taxes by total liabilities to measure rate of earnings of total capital employed.
- Dividing net income and income taxes by proprietary equity and fixed liabilities to produce a rate of earnings on invested capital.
- Dividing net income by total capital plus reserves to calculate the rate of earnings on proprietary equity and stock equity.

3.10.5 Return on Equity (ROE)

ROE is sometimes called “return on net worth.” (RONW)

According to this ratio, profitability is measured by dividing the net profit after tax (but before preference dividend) by the average total shareholders’ equity. The term shareholders equity includes:

i) Preference share capital

ii) ordinary shareholders equity consisting of a) equity share capital b) share premium and c) reserve and surplus less accumulated losses. The ordinary shareholders equity is also referred to as net worth. Thus,

\[
\text{Return on total shareholders’ equity} = \frac{\text{Net PAT}}{\text{Average total shareholders equity}} \times 100
\]

The ratio reveals how profitability the owner’s fund have been utilized by the firm.
The amount of net income returned as a percentage of shareholders equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

There are several variations on the formula that investors may use:
1. Investors wishing to see the return on common equity may modify the formula above by subtracting preferred dividends from net income and subtracting preferred equity from shareholders' equity.
2. Return on equity may also be calculated by dividing net income by average shareholders' equity. Average shareholders' equity is calculated by adding the shareholders' equity at the beginning of a period to the shareholders' equity at period's end and dividing the result by two.
3. Investors may also calculate the change in ROE for a period by first using the shareholders' equity figure from the beginning of a period as a denominator to determine the beginning ROE. Then, the end-of-period shareholders' equity can be used as the denominator to determine the ending ROE. Calculating both beginning and ending ROEs allows an investor to determine the change in profitability over the period.

One of the most important profitability metrics is return on equity (or ROE for short). Return on equity reveals how much profit a company earned in comparison to the total amount of shareholder equity found on the balance sheet. If you think back to lesson three, you will remember that shareholder equity is equal to total assets minus total liabilities. It's what the shareholders "own". Shareholder equity is a creation of accounting that represents the assets
created by the retained earnings of the business and the paid-in capital of the owners.

A business that has a high return on equity is more likely to be one that is capable of generating cash internally. For the most part, the higher a company's return on equity compared to its industry, the better.

3.10.6 Return on Working Capital (ROWC)

Working capital (abbreviated WC) is a financial metric which represents operating liquidity available to a business, organization, or other entity, including governmental entity. Along with fixed assets such as plant and equipment, working capital is considered a part of operating capital. Net working capital is calculated as current assets minus current liabilities. It is a derivation of working capital that is commonly used in valuation techniques such as DCFs (Discounted cash flows). If current assets are less than current liabilities, an entity has a working capital deficiency, also called a working capital deficit.[12]

\[
\text{Working Capital} = \text{Current Assets}
\]
\[
\text{Net Working Capital} = \text{Current Assets} - \text{Current Liabilities}
\]
\[
\text{Net Operating Working Capital} = \text{Current Assets} - \text{Non Interest-bearing Current Liabilities}
\]
\[
\text{Equity Working Capital} = \text{Current Assets} - \text{Current Liabilities} - \text{Long-term Debt}
\]
3.10.7 Current Ratio (CR)

\[
CR = \frac{\text{Current Assets}}{\text{Current Liabilities}} \times 100 \quad \text{(times)}
\]

Current Liabilities

The current ratio measures the short term solvency or liquidity. It shows the extent to which the claims of short-term creditors are covered by assets. The current ratio is essentially looking at the working capital of the company. Effective management of working capital ensures the organization is running efficiently. This will eventually result in increased profitability and positive cash flows. Effective management of working capital involves low investment in non productive assets like trade receivables, inventory and current account bank balances.

The normal current ratio is around 1:2 but this varies within different industries. Low current ratio may indicate insolvency. High ratio may indicate not maximizing return on working capital. Valuation of inventories will have an impact on the current ratio, as will year end balances and seasonal fluctuations.

Current ratio matches current assets with current liabilities and tells us whether the current assets are enough to settle current liabilities. Current ratio below 1 shows critical liquidity problems because it means that total current liabilities exceed total current assets. General rule is that higher the current ratio better it is but there is a limit to this. A current ratio higher than 2:5 might indicate existence of idle or underutilized resources in the company.

The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable
the company is of paying its obligations. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. While this shows the company is not in good financial health, it does not necessarily mean that it will go bankrupt - as there are many ways to access financing - but it is definitely not a good sign.[12]

3.10.8 Acid Test (Quick) Ratio (QR)

Formula:

\[
\text{Quick Ratio} = \frac{\text{Current assets less inventories}}{\text{Current liabilities}} \times 100 \text{ (times)}
\]

The ratio measures the immediate solvency of a business as it removes the inventories out of the equation, which is the item least representing cash, as it needs to be sold. Normal is around 1:1 but this varies within different industries.

In finance, the Acid test or quick ratio or liquid ratio measures the ability of a company to use its near cash or quick assets to extinguish or retire its current liabilities immediately. Quick assets include those current assets that presumably can be quickly converted to cash at close to their book values. A company with a Quick Ratio of less than 1 cannot currently pay back its current liabilities.

If quick ratio is higher, company may keep too much cash on hand or have a problem collecting its accounts receivable. Higher quick ratio is needed when the company has difficulty borrowing on short-term notes. A quick ratio higher than 1:1 indicates that the business can meet its current financial obligations with the available quick funds on hand.
Quick ratios lower than 1:1, may indicate that the company relies too much on inventory or other assets to pay its short-term liabilities.

Many lenders are interested in this ratio because it does not include inventory, which may or may not be easily converted into cash.\[12\]

### 3.11 Statistical tests in the present research

#### 3.11.1 SPSS program

SPSS stands for Statistical Package for the Social Sciences, and it organizes quantitative research data into various statistical formats to determine the relevance of variables associated with the research topic.

Developed primarily for researchers in the field of social science in the 1960s, SPSS has since been adapted by practically every profession commonly using research and quantitative data analysis, and it frequently serves as the standard data analysis software for undergraduate and graduate statistics students. In 2008, SPSS Inc. changed the SPSS Statistics brand to PASW, Predictive Analytics Software, and Statistics.

In quantitative research, the researcher must rely on the relevance of the dependent and independent variables to each other and to the population targeted by the research topic. SPSS/PASW helps researchers arrive at statistical relevance with efficiency and accuracy, and many scholars and researchers consider it a critical tool.

SPSS is a computer program used for survey authoring and deployment (IBM SPSS Data Collection), data mining (IBM SPSS Modeler), text analytics, statistical analysis, and collaboration and deployment (batch and automated scoring services).
Among its features are modules for statistical data analysis, including descriptive statistics such as plots, frequencies, charts, and lists, as well as sophisticated inferential and multivariate statistical procedures like analysis of variance (ANOVA), factor analysis, cluster analysis, and categorical data analysis. SPSS is particularly well-suited to survey research.\textsuperscript{[13]}

3.11.2 Average method (mean)

Mean or average is the sum of the score of all the individual parameters in the sample divided by the number of such score. The formula for mean is as given below:

\[
\text{Mean (average)} = \frac{\sum x}{N}
\]

\(\sum\) (called sigma) is the statistical symbol for sum, \(x\) stands for scores and \(N\) stands for the number of scores. Mean is probably the most used statistic and is simply the arithmetic average of a distribution of score. Researchers tend to like it because it provides a single, simple number that gives a rough summary of the distribution. It must however be remembered that while mean provides a useful piece of information, it does not tell anything about how spread out the scores are i.e. variance or how many scores in distribution are close to mean. It is possible for a distribution to have very few scores at or near the score. Also mean is not useful when the distributions are open-ended. If scores representing infinity in either direction are possible, the mean cannot
really be defined. Also it is tedious to compute mean by hand (Denscombe, 2007)\textsuperscript{[14]}.

### 3.11.3 T-test

The t-test assesses whether the means of two groups are statistically different from each other. This analysis is appropriate whenever you want to compare the means of two groups, and especially appropriate as the analysis for the posttest only two groups randomized experimental design.

![Diagram of T-test](image)

Figure 3.1. Idealized distributions for treated and comparison group posttest values.
Figure 3.2. Three scenarios for differences between means

It shows the distributions for the treated (blue) and control (green) groups in a study. Actually, the figure shows the idealized distribution -- the actual distribution would usually be depicted with a histogram or bar graph. The figure indicates where the control and treatment group means are located. The question the t-test addresses is whether the means are statistically different.

This is probably the most widely used statistical test of all time, and certainly the most widely known. It is simple, straightforward, easy to use, and adaptable to a broad range of situations. No statistical toolbox should ever be without it.\cite{15}

3.11.4 Karl Pearson’s correlation coefficient = r

Karl Pearson’s Product-Moment Correlation Coefficient or simply Pearson’s Correlation Coefficient for short, is one of the important methods used in Statistics to measure Correlation between two variables.
Karl Pearson was a British mathematician, statistician, lawyer and a eugenicist. He established the discipline of mathematical statistics. He founded the world’s first statistics department in the University of London in the year 1911. He along with his colleagues Weldon and Galton founded the journal “Biometrika” whose object was the development of statistical theory.

The Correlation between two variables X and Y, which are measured using Pearson’s Coefficient, give the values between +1 and -1. When measured in population the Pearson’s Coefficient is designated the value of Greek letter rho (ρ). But, when studying a sample, it is designated the letter r. It is therefore sometimes called Pearson’s r. Pearson’s coefficient reflects the linear relationship between two variables. As mentioned above if the correlation coefficient is +1 then there is a perfect positive linear relationship between variables, and if it is -1 then there is a perfect negative linear relationship between the variables. And 0 denotes that there is no relationship between the two variables.

The degrees -1, +1 and 0 are theoretical results and are not generally found in normal circumstances. That means the results cannot be more than -1, +1. These are the upper and the lower limits.\[16\]

Pearson’s coefficient computational formula:

\[
r = \frac{\sum_{i=1}^{N} x_i y_i - \frac{1}{N} \sum_{i=1}^{N} x_i \sum_{i=1}^{N} y_i}{\sqrt{\left( \sum_{i=1}^{N} x_i^2 - \frac{1}{N} \left( \sum_{i=1}^{N} x_i \right)^2 \right) \left( \sum_{i=1}^{N} y_i^2 - \frac{1}{N} \left( \sum_{i=1}^{N} y_i \right)^2 \right)}}
\]
3.12 Limitation of the study

Though inflation accounting is more practical approach for the true reflection of financial status of the company, there are certain limitations which are not allowing this to be a popular system of accounting. Following are the limitations:

1. Change in the price level is a continuous process.

2. This system makes the calculations a tedious task because of too many conversions and calculations.

3. This study is limited to the selected company and period of the study is limited to 5 years from 2006-2007 to 2010-2011 for generalization of findings.

4. The findings is based on the ability of not give their true information, it deals marginal errors.

5. Also we have a small sample size due to limited information disclosure and data accessibility.

6. Consequence, the result of the study should be interpreted with caution as the annual reports and financial statements don’t provide detailed information for our study.
References


2. Institute of Chartered Accountant of England and Wales (IVAEW), 1988, p.6.11.


7. Dr.S.P.Gupta, Statistical methods Ex. Head & Dean, Faculty of Management Studies, University of Dehli,Dehli


