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3.1 INTRODUCTION:

Modern financial statements are prepared for the presentation of financial accounts. These financial statements are also useful to know the economic activities, progress position and success or failure of business unit. But the analysis and interpretation of these financial statements is required to get the complete, true and natural opinion regarding economic position of business unit. Ratio analysis is a useful tool and techniques for the same. Accounting ratios indicate such picture of solvency-liquidity, profitability, productivity and capital structure of a business unit. Ratios analysis presents the statistical, mathematical and logical relation between two or more accounting data through accounting ratios. These ratios are derived from financial statements hence analysis of accounting ratios is became the decisive and auxiliary factor for the fundamental functions of management such as planning, controlling communicating and policy-strategy formation and its implementation.

Financial statements are presented according to the guidelines of accounting tradition principles-standards and rules and regulations of related laws. In spite of various usefulness of financial statement, they have some specific limitations. They do not provide such information regarding profitability, solvency, return on capital, case liquidity of business to such parties i.e. share holders, investors, creditors, banks, financial institutions etc. they also do not provide information for decision making to management or owners of a firm. Analysis and interpretation of financial statements is requiring solving these limitations. In this chapter we shall discuss about ‘Ratio Analysis’ among the various tools and techniques of financial analysis and interpretation.

Profit is the legitimate object of our society and prima facie object of every business. It is barometer of the success of business. Profit is the pivot around which revolve the various activities of business. In the opinion of R.E.V. Duck and F.R.J. Jervis, “perhaps the most important reason for keeping accounts as par as management of the business is concerned that the information contained in them provides the means of measuring the progress of a business, of testing its pulse and at indicating when and where remedial action, if necessary, shall be taken.”

The survival of any business depends upon its earning capacity. Thus, if an enterprise fails to make profit, capital invested is eroded and if this situation prolongs, the
enterprise ultimately ceases to exist. In fact, profit is the soul of business without which it is lifeless. Indeed, the efficiency of a business concern is measured by the amount of profits earned. The larger the profits the more efficient and profitable the business is demand to be. According to R.R. Glitchrist, the profit is the ultimate measure of effectiveness. A profitable company is likely to offer not only security of employment but also promotion prospects, job opportunities and the intense personnel motivation that comes from being associated with success. Profitability means the profit earning ability of enterprise, and the capacity of management to generated surplus in the process of business operations. It is overall measure of efficiency.

Profitability is distinguished from “profits”. Profits refer to the absolute quantum of profits where the profitability refers to the ability to earn profit.

W.M. Harper remarks that profitability is a relative measure; it indicates the most profitable alternative. Profit, on the other hands, is an absolute measure – it indicates the overall amount of profit earned by a transaction. Very high profit doses not always indicate a sound – organizational efficiency and low profitability is not always a sign of organizational sickness.

In many a situation, it is happens that when a concern is implementing expansion plans, it may run in to short term losses, therefore it can be said that profit is not the prime variable on which the operational efficiency and financial efficiency of an organizational can be compared.

Profitability is required to judge the degree of operational efficiency of management, controlling operations and performance. It is also used to study “relative efficiency” with other firms.

An analysis of profitability reveals how the profit position stands as a result of total translations made during the year. Such analysis is particularly interesting to the supplier of funds who can evaluate their investment and take decision accordingly. On the other hands, profit ratios are equally helpful to the management because these rations reflect the efficiency of the enterprise as a whole. B.B.Howod and M.Upton observe that the “profitability” may be defined as the ability of an investment to earn to return on its use. Thus profitability is the ability of an organization to earn profit. In
other words, profitability is a composite concept relating the efficiency of an organization to earn profit.

3.1.1 **FINANCIAL ANALYSIS AND INTERPRETATION:**

Financial analysis means, arrangements and division of important accounting information which establishes logical relation to drive specific, meaningful interpretation and clarity of accounting data. Financial statement presents accounting information in numerical form. These numerical accounting data do not directly provide the information regarding the seven “P” i.e. (1) Profitability (2) Position (3) Progress (4) Performance (5) Perfection (6) prospectus and (7) Power of earning. So that through financial analysis of financial statements it is require establishing some statistical, mathematical inter relationship between accounting data of two time period. Following are method and techniques to analyses financial statement.

1. Comparative financial statement
2. Financial analysis by trend percentage
3. Common size statements.
4. Fund flow statement analysis.
5. Cash flow statement analysis.
6. Break even analysis techniques.
7. Value added analysis.
8. Ratio analysis.

3.1.2 **RATIO ANALYSIS: MEANING AND NATURE:**

Accounting ratios play important roles to arrange establish accounting data for significant analysis of accounts. Ratio analysis is a famous and popular technique to analyze accounts. Following are the meaning and definition terms.

* Ratio:

**Hingorani, Ramanatnans and Grewal:** “The relationship between the two figure expressed mathematically is a ratio.”

**Dr. S.N. Maheshwary:** “Accounting ratios are relationship expressed in mathematical terms between figures which are connected with each other in some manners.”
Ratio establishes the inter relationship of two figures/item of profit and loss A/C and balance sheet etc. so, as to find out the measure between the two.

* Accounting Ratio:

**J.Batty:** The term ‘Accounting ratio’ is used to describe significant relationship which exist between figures shown in a balance sheet, in a profit and loss A/c, in a budgetary control system or in any other part of the accounting organization.”

“The figures for numerator or denominator taken from books of accounts is called accounting ratio.”

* Ratio Analysis: Meaning and Nature

First time, in 1919 Alexander Wale used the accounting ratios. He used current ratio to verify the application from firms to get loans from banks. As a result, the verification of loan applications became easy, speedy and accurate.

“Ratio Analysis implies the process of computing, determination and presenting the relationship of item and group of financial statements.”

In modern times, ratio analysis is used to take decision for different objective. Different parties related to a company, e.g. Banks, investor, government, creditors, shroffs, and shareholders etc. use these different types of accounting ration to take important decisions.

Ratio analyses provide an easy means to compare current performance with past and or with the performance of other unit of the same industry. It reveals the weakness and strength of a company.

Ratio analysis is a process of comparison of one figure against another which makes a ratio and the appraisal of ratios to make proper analysis about the company’s financial stability and position ratio analysis – i.e. proper analysis and interpretation of the ratios can be made only by the skilled and expert analyst. While interpreting the financial data and details the analyst should be careful regarding limitations imposed due to accounting concepts and valuation methods.

3.1.3 **CLASSIFICATION OF ACCOUNTING RATIOS:**

Following chart presents the classification of various types of accounting ratios by considering different objectives, functions and basis.
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Accounting to above chart of classification of accounting ratios following are the detailed explanation

**(A) Traditional Classification:**
Accounting ratios are divided into following three categories on the basis of financial statement as per the traditional classification. Total 28 ratios are included in this classification.
The traditional classification has been made on the basis of the financial statements to which determinates of a ratio belong. On this basis the ratio could be classified as.

**(1) Ratios of Profit and Loss A/c:**
While one figures of profit and loss A/c is presented with other figures of the same profit and loss A/c through a logical, mathematical relation of numerator and denominator, the ratio is known as profit and loss A/c ratio. Following is the list of such ratios.

Ratio is calculated on the basis of the items of profit and loss account only.

1. Gross profit ratio (G P ratio)
2. Net profit ratio (N P ratio)
3. Operating ratio
4. Expenses ratio
5. Stock ratio

**(2) Ratios of Balance Sheet:**
While one figures of B/s is presented with other figures of the same B/s through a logical, mathematical relation of numerator and denominator the ratio is known as B/s ratio. Following is the list of such ratios.

Ratios are calculated on the basis of the figure of balance sheet only.

1. Current ratio
2. Liquid ratio
3. Acid-test ratio Or Quick ratio
4. Proprietary ratio Or Owners ratio [on the basis of total assets or total liabilities]
(5) Fixed capital – Fixed assets ratio [Long term fund to fixed assets ratio]
(6) Reserve and capital ratio
(7) Assets ratio
(8) Debt-equity ratio
(9) Gear ratio or gearing ratio or capital gearing ratio

(3) Composite ratios:

These ratios are also known as ratios of profit and loss A/c and B/s while one figures of profit and loss A/c presented with others figures of Balance sheet through a logical mathematical relation either as numerator or as composite ratio. Following is the list of such ratios.

Ratio is calculated on the basis of profit and loss account as well as the balance sheet.

(1) Ratio of return on capital employed (ROCE)
(2) Rate of return on shareholder’s fund
(3) Rate of dividend on ordinary or equity share capital
(4) Debtors ratio or debtors turnover or debtors velocity
(5) Creditors ratio or creditors turnover or creditor velocity
(6) Total assets turnover or velocity
(7) Fixed assets turnover or velocity
(8) Current assets turnover or velocity
(9) Debt capacity ratio or debt coverage ratio
(10) Interest coverage ratio
(11) Rate of return on total assets
(12) Earnings per share (EPS)
(13) Dividend per share (DPS)
(14) Dividend payout ratio (DPR)

(B) Functional classification:

Accounting to functional matters of business activity, following ratios are classified for analysis and interpretation of financial position of business unit.

(1) Ratios regarding analysis and interpretation of liquidity activity and solvency:
   (1) Current ratio
   (2) Liquid ratio
(3) Acid test ratio or quick ratio
(4) Debtors ratio or debtors turnover velocity
(5) Creditors ratio or creditor turnover velocity
(6) Total assets turnover or velocity
(7) Fixed assets turnover or velocity
(8) Current assets turnover or velocity
(9) Stock ratio or stock turnover or velocity

(2) Ratios regarding analysis and interpretation of long term economic Position and leverage capital structure:
(1) Reserve and capital ratio
(2) Debt- equity ratio [on the basis of long term debt] or total debt equity ratio
   [on the basis of long term and short term both debt]
(3) Interest coverage ratio
(4) Assets ratio
(5) Gear or capital gear ratio
(6) Proprietary ratio [contribution of total owner’s fund in to total assets] or
   [owner’s ratio on the basis of external debt to owner’s fund]
(7) Fixed capital and fixed assets ratio

(3) Ratios regarding analysis and interpretation of profitability and Efficiency:
(1) Gross profit ratio (G P ratio)
(2) Net profit ratio (N P ratio)
(3) Operating ratio
(4) Expenses ratio

(4) Ratios regarding analysis interpretation of overall profitability for total Investment and owner’s fund:
(1) Ratio of return on shareholder’s (fund) investment
(2) Ratio of return on equity (ordinary) share holder’s fund
(3) Ratio of return on equity share capital (or ratio of dividend to equity share capital)
(4) Ratios of return on total assets
(5) Earnings per share (EPS)
(6) Dividend per share (DPS)
(7) Dividend payout ratio (DPR) and rented earnings ratio (RER)
(8) Return on capital employed

(C) **Classification on the basis of importance of accounting data:**

(1) **Earnings ratios:**
The ratios for gross profit, rate of return on capital on capital employed, earning per share, rate of return on owner’s fund etc. are indicate earning capacity, hence these ratios are called earnings ratio.

(2) **Capital structure ratio:**
To know the relation regarding application of fund i.e. owner’s fund and long term loan fund the ratio like owner (proprietary), gearing and debt equity are computed. The ratios indicate the proportion of debt fund and owner fund in capital structure, hence they are known as capital structure ratios.

(3) **Solvency ratio:**
These ratios indicate the liquidity, soundness and solvency of economic transaction and financial position. Current ratio, liquidity ratio, debtors’ ratios, creditors’ ratios etc. are computed for knowing solvency of business unit.

(4) **Ratios related to management:**
These ratios are computed to know and to evaluate the efficiency level of managers and management. Ratios such as GP, NP, ROCE, and operating ratios, debtors’ ratio, creditors’ ratios, stock ratios and return on total assets etc. are included in management ratios.

(D) **Classification on the basis of user’s parties:**

(1) **Ratios for managers - management:**
These ratios are computed to know and to evaluate the efficiency level of managers and management. Ratios such as GP, NP, ROCE, and operating ratios, debtors’ ratio, creditors’ ratios, stock ratios and return on total assets etc. are included in management ratios.
(2) **Ratios for creditors and financers:**
Creditors and financers such as banks, financial instates etc. are interested for security and solvency of their debts and dues in the company. They check companies’ liquidity and solvency in relation to their debts and dues by computing or by knowing the ratios such as current ratio, acid test ratio, debtors’ ratio, creditors’ ratio, stock ratio, and total assets debts ratio.

(3) **Ratios for shareholders:**
Shareholders are interested to know about the financial and economic position regarding their investment in company, its solvency, and company’s total fund, dividend etc. for that purpose they compute or consider the ratios such as EPS, gearing ratio, return on owner’s fund, dividend per share and dividend pay ratio etc.

**3.1.4) Explanation of Accounting Ratios [Formula and Usefulness]:**
A detailed explanation has been discussed of the accounting ratios according to traditional classification for the purpose of financial analysis.

**(A) PROFIT AND LOSS A/C RATIOS:**

(1) **Gross Profit Ratio: (G P Ratio):**
Absolute figure of gross profit does not show the profitability of a firm or of a unit. To calculate the rate of gross profit on sales, will be the easiest way to know the profitability of a unit.

**Formula:** 

\[
G \text{ P Ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100
\]

**Note:** To get G P there are two methods

1. To prepare trading account.
2. To calculate cost of goods sold. Than deduct it from the amount of sales.

**Uses:**
1. To know the profitability of a unit.
2. To know the whether the selling price is appropriate.
3. To increase the profitability.
Ideal Proportion:

For good remark the G P Ratio should be 35%, but no ideal proportion is decided for fixed up. To knows the satisfactory conditions as to profitability of the unit. One has to compare the ratio with the industry’s ratio as a whole or with the ratio of another firm, running the same business.

(2) Net Profit Ratio: (N P Ratio):

This ratio also gives us the information as to profitability of a unit. One can rely more on this ratio than gross profit ratio, as one can be more accurate about the profitability of a firm because on the basis of net profit, this ratio is calculated. Only operating or business income should be taken in to account.

Formula: \( \text{N P Ratio} = \frac{\text{Net Profit}}{\text{Sales}} \times 100 \)

Note: (1) to calculate net profit, non operating or non business income are not taken in to account e.g. int. on non business investments in the same way loss on sale of fixed assets should also not be taken.

(2) (A) Calculate net profit as per profit and loss account.

(B) Point shown above under note 1 should be taken in to account.

(C) Deduct provision for taxation also.

Uses: (1) Owners can measure the accuracy of profitability.

(2) Net with the help of gross profit, but also with the help of net profit ratio, one cannot judge the profitability. Really saying, one cannot judge accurately the profitability without net profit ratio.

(3) If gross profit ratio is up to the mark, but net profit ratio is not an ideal one, then one has to consider the point of more administrative and selling-distribution or financial expenses.

(4) This ratio is useful to control the expenses with the help of suitable measures.
(5) For investors also, this ratio is useful to compare the profitability of different firms of the same industry, to take decision to invest the fund.

Ideal Proportion:

For good remarks NP Ratio should be 15% to 20% but no standard ratio is fixed up. To know whether this ratio is satisfactory, one shall have to compare the ratios of different years of the unit. One can get the trend of profit. If it is increasing, it is satisfactory. Inter-firm comparison should also be made to know the satisfactory level of this ratio.

Limitations:

On the basis of this ratio only, one cannot decide whether investment should be made or not. Other factors, e.g. prospects, inter-firm competition, government policy etc. are also taken in to account.

(3) Operating Ratio:

This ratio show the relation between expenses of business activities (including cost of sales) and sales

\[
\text{Formula: Operating Ratio} = \frac{\text{Cost of Sales + Operating Exp.}}{\text{Sales}} \times 100
\]

Where cost of sales = Op. stock of raw materials + Purchases – Closing stock of raw material OR Cost of sales = Sales – Gross Profit

This ratio gives the information regarding the managerial efficiency of a company. If this ratio is increased time to it shows that the control function is become ineffective and the operating expenses are uncontrollable. If the ratio is low the management efficiency is high. If this ratio is become low, then company can raise the reserve and dividend. It is also true that the management efficiency for the same should be measured with compared to other company’s operating ratio.

(4) Expense ratios:

These ratios show us the proportion of expenses with respect to sales. With the help of these ratios the unit decides the measures to control the expenses for aiming at
minimization of cost and maximization of profit. The following are some of the expenses ratios

**Formula:**

1. Direct Expenses Ratio = \( \frac{\text{Direct Expenses}}{\text{Sales}} \times 100 \)
2. Indirect Expenses Ratio = \( \frac{\text{Indirect Expenses}}{\text{Sales}} \times 100 \)
3. Adm. Expenses Ratio = \( \frac{\text{Adm. Expenses}}{\text{Sales}} \times 100 \)
4. Financial Expenses Ratio = \( \frac{\text{Financial Expenses}}{\text{Sales}} \times 100 \)
5. Selling & Dist. Expenses Ratio = \( \frac{\text{Selling & Dist. Expenses}}{\text{Sales}} \times 100 \)

**Uses:**
The company can control the expenses after having found the ratios and comparing them with the ratios of the past years. The ratios may also be compared with the ratios of the rivals. The effects on profitability of the firm are measured on the basis of the trend of the ratios for some years. If there is an increasing trend, the reasons therefore should be treated out to control the expenses.

**Note:**
To know the weight age of expenses on cost, sometime the ratios related to raw materials, wages, indirect wages, manufacturing expenses etc. are found out. On the basis of requirement, sometimes, in denominator instead of sales, figures of direct wages or amount of manufacturing cost or cost of production are taken in to account.

**(B) RATIO OF BALANCE SHEET:**

**(5) Return on Shareholder’s funds:**

This ratio is a quotient between profit available to share holders and shareholder’s funds. Amount of return for share holders is PAT (profit after interest and tax). Share holders funs include equity and preference share capital, reserve and surplus.

**Formula:** Return on share holders’ funds Ratio = \( \frac{\text{PAT} \times 100}{\text{Share holders funds}} \)
Note: (1) Share holders funds = Equity Share Capital + Pref. Share Capital + Reserve and surplus – Fictitious Assets
(2) Net Profit = PAT (Profit after Payment of Interest and Tax)

Uses: These ratios show whether or not sufficient return are available to owners of an enterprise who invest their money and take risk.

(6) Rate of Dividend (or Return) on Equity Share Capital:
This ratio shows the relation between Net Profit and Equity share capital. This ratio is also indicating that how many percentages of dividends can be distributed to their share holders.

**Formula:** Rate of dividend (or Return) on Eq.S.Capital
\[
\text{Rate of dividend (or Return) on Eq.S.Capital} = \frac{\text{Net Profit After Pref. dividend}}{\text{Equity Share Capital}} \times 100
\]

For the investors point of view this ratio is very important and it shows capacity of company.

(7) Rate of Return on Total Assets:
Total assets of business include owners and other external creditors/investors capital applied in assets. The rate of return on total assets can be calculated by dividing net profit and interest to total assets.

**Formula:** Rate of Return on Total Assets = \( \frac{\text{Net Profit After Tax + Interest}}{\text{Total Assets}} \times 100 \)

(B) COMPOSITE RATIO:

(8) Return on Capital Employed Ratio (ROCE):
With the help of this ratio, we can know rate of return on capital employed.

**Formula:** Debt-Equity Ratio = \( \frac{\text{EBIT}}{\text{Capital Employed}} \times 100 \)

Note:

(1) Capital employed includes equity and pref. share capital, debentures, reserve and surplus, retained earnings, long term loans etc.
(2) If net profit is given after deduction of interest and tax, they should be added back.

Uses:
This ratio is useful and important for money-leaders, shroffs, owners and investors. However satisfactory the G.P.R, N.P.R or operating profit ratio are one cannot invest, but for the knowledge of rate of return on investment and the comparison of this ratio with the prevailing rate in the market.

Ideal proportion:
No slandered is fixing up. One should compare the ratio with the prevailing rates in the market and make inter – industry comparison and inter- firm comparison to know the satisfactory level of this ratio.

(9) Earnings per Share:
This is useful ratio to know the rate of return on equity share or earning per share. Reserve and surplus are not taken in to account.

Formula: Earning Per Share = \[ \frac{\text{Return (Profit) available to Equity Share holders}}{\text{Number of Equity Share}} \]

Whereby return to equity share holders = PAT- Pref. Dividend

Uses: Earning per share is known with the help of this ratio.

Note: Ratio useful to different interested parties already been discussed somewhere herein before, repetition are avoided. (Not require)

(10) Interest Coverage Ratio:
This ratio is useful know if the company has sufficient profit to pay its liability of interest.

This is a useful ratio to money –lenders, banks or shroffs when they want to know as to the capability of an enterprise to pay back the amounts of debts. Whether or not the industry is able to pay the installment inclusive of interest out of its profit, can be known with the help of this ratio.
Formula: Interest Coverage Ratio = \frac{EBIT}{Interest}

This ratio shows that how many times the interest payable is covered by the amount of profit. As a result, it will be easy for an industry to decide whether more capital should be borrowed, to get benefits of trading on equity.

Uses: The higher is the ratio, the safer are the money-lenders like banks, shroffs and debenture holders.

Ideal Proportion:

No standard is fixed up decide the ideal proportion. However, the higher ratio is preferred considering the type of a business or an industry.

This ratio also indicates the earning capacity and management efficiency of an enterprise. A higher ratio assures the money-lenders and debenture holders have a safety of their finance.

(3.1.5) Importance of Accounting Ratios OR Ratio Analysis:

Financial analysis depends to a very large extent on the use of ratios though there are other equally important tools of such analysis. A variety of classics, e.g. shareholders, creditors, banks, debenture holders, government, use the ratio analysis now-a-day. Ratio analysis is useful to know financial position of a company and profitability of any concern. The following are some of the advantages.

(1) To know and to ascertain the liquid position of an enterprise:

The use of ratios was made by the banks to ascertain the liquidity of a firm. The current ratio, liquidity ratio and acid test ratio show us if the business will be able to pay its current liabilities. Banks, money lenders & will be able to judge from these ratios whether the firm will be able to pay back its debts.

(2) To know the profitability:

A variety of profitability ratios, via, the gross profit ratio, and ratio of return on capital employed give an idea of the profitability of an enterprise. On the basis of these ratios investor can have an idea about the business efficiency. By means of these ratios
management can consider the employee’s efficiency. Creditors and suppliers can know the repayment capacity of the borrowers and purchasers.

(3) Possibility of inter-firm comparison:

If the ratios are not compared with the ratios of other firms of the same industry, they are less useful. The inter-firm comparison shows the loopholes of the firms. Measures to improve the position can be taken.

(4) Useful for decision-making:

Ratios guide the management in taking important decisions. Suppose the liquidity ratios show an unsatisfactory condition, the concern will get more liquid funds. The efficiency or otherwise of the enterprise, can be decided on the basis of their profitability ratios.

(5) Ratios are useful for budgetary control:

Where the system of the budgetary control is in use, report therefore, will be prepared in a concern. To give a good idea about financial position, various ratios are given with these reports.

(6) One can know the efficiency or otherwise of employees and departments:

The turnover ratios are guide to measure the efficiency of employees. E.g. the debtor’s turnover will show the efficiency of collection department. Likewise stock turnover shows use us the speed of sales. Earnings per share show us the earning of the company. Assets turnover indicates the efficiency with which the assets are used. In this way, the ratio shows us profitability, liquidity and efficiency of a concern.

“Ratio analysis one of the important tools of financial analysis. They assist the management in its basis function of forecasting, planning, control and communication”

3.2 PRODUCTIVITY AND PROFITABILITY:

The performance of business firm can be evaluated or measured from a number of prospective, and there are various quantitative as well as qualitative criteria that can be employed for this purpose. Productivity and profitability is the two separate
devices for the measurement of overall efficiency of a business firm. Productivity is defined as the ratio of outputs to inputs, output in the form of products or services and inputs are the resources which are put in to convert in to outputs. It is the quality or state of being productive. It is a concept that guides the management of production system and measures sits success. It is the qualities that indicate how efficiency the material, the labor, the capital and the capital and the energy can help to identify area for corrective actions towards planning of business firm.

Capital and labor happen to be the two most important factor of production and the profitability of the business firms depends greatly on how efficiency and effectively it utilizes these two factors of production. The productivity of capital can be measured by the ratio the greater would be the productivity of capital. If productivity of business firm increases the profitability will also increase. Thus profitability of the business firm largely depends on the productivity. Though both are different concept of measuring the performance of business, their calculation is same base on the ratio. The calculation formulas are as under.

**Profitability = Operating Income/ Operating Assets, Productivity= Output/ Input**

Where operating income means, income from utilization of capital employed in the business firm and operating assets means capital employed. Chen and Mc Garrach pointed out that “with due allowance for temporary currency value fluctuations of changes in commodity or product price, there is strong positive co-relation among time series data measuring productivity, profitability and efficiency. Profit may be high or law due to change in selling price of commodities and services, inflationary effects, Governmental policy etc.

### 3.3 PROFITABILITY AND EFFICIENCY:

Profitability is also not synonymous with efficiency thought it is an index of efficiency, it is regarded as a measure of efficiency and management guide to greater efficiency. No doubt profitability is an important yardstick of efficiency, but the extent of profitability cannot be taken as a final proof of efficiency. Some time satisfactory profit can make inefficiency and conversely a proper degree of efficiency can be accompanied by an absence of profit. The net profit figure simply revels a satisfactory balance between the values receive and value given. The change in operational efficiency is merely one of many factors on which profitability of an
enterprise largely depends between cost and profitability. Moreover, there are many other factors besides efficiency which affects the profitability.

3.4 FACTORS AFFECTING THE PROFITABILITY:
The following are the two main factors which affects the profitability of a business firm.

(1) The operational profit margin.

(2) The rapidity of turnover of capital employed.

Profitability is the product of these two factors and, therefore maximum or optimum profit can be earned only by maximizing them. The combination of these two factors is known as the “Triangular Relationship.” Their significance exit not only in it’s as an analytical tool but also because the profitability ratio can be calculated directly from the specific earnings and investment data. It is also useful in explaining the two forces bearing upon ultimate results and therefore, establishes the area of business operations which must be properly controlled if expected results are to be achieved.

It can be shown is an equation from as under:

\[
\text{Profitability} = \frac{\text{sales}}{\text{Operating Assets}} \times \frac{\text{Operating Income}}{\text{Sales}} = \frac{\text{Operating Income}}{\text{Operating assets}}
\]

Where “Operating Assets” are used for capital employed and income from utilization of capital employed in the business firm, respectively. The interrelationship between the above ratios has to be understood with a view to analyzing profitability. The rate of return on investment is the result of the profit margin and turnover of assets in sales. These two components are multiplied for arriving at the profit percentage on investment. Each of these two components is itself an end product of a sequence of interrelated factors. These components are helpful in investigating the financial composition, analyzing current financial position and formulating the financial forecasting for future of a business firm. Moreover, the interrelationship can also, be well understood with the help of Du-Pont Chart.

3.5 THE DU-PONT CHART:
The interrelated components are shown profit path. The mechanics of profit path are based on the chart which is developed by E.D. Du-Pont De Nemours Company, Wellington, USA. This chart is popularly known as Du-Pont chart. It is very useful
device for evaluating profitability of inters industry and inter product etc. The profit performance of business firm can be analyzed with the help of Du-Pont chart.

Return On Investment (%)  

\[ \text{Return On Investment} = \frac{\text{Net Profit}}{\text{Total Assets}} \]

Net Profit Margin (%)  

\[ \text{Net Profit Margin} = \frac{\text{Net Profit}}{\text{Net Sales}} \]

Net sales+ Non Operating Surplus  

Total Cost  

Cost of Goods Sold  

Operating Expenses  

Interest  

Tax  

Net Sales  

Current Assets  

Net fixed Assets  

Cash & Bank Balances  

Receivable  

Inventories  

Other Current Assets
Du-Point chart showing inter-relationship of factors affecting return on investment.

It is clear from the Du-Point chart that the rate of return on investment is affected by a number of factors. It may be noted that the analytical chain in this chart is developed along with tiers. The first sequence started with the net profit margin shown in percentage, which is calculated by dividing net profit is equal to net plus non operating surplus less total cost and the total cost include cost of goods sold, operating expenses interest and tax. In the second tier the sequence states with total assets turn over, determined by dividing net sales by total assets. Total assets, of course represents current plus net fixed assets. Current assets include cash and bank balance, receivables, inventories and other current assets.

“The two tier approach concentrates attention on the separate forms contribution to profit. Improvement can be accomplished either through more effective use of available capital measured by the turn over sequence or through a better relationship between sales and expense measured by the profit margin sequence. For providing standard of evaluations, calculations are made on the ratio of return investment assets turnover and profit margin for compatible companies.”

Lastly, the financial decisions and policy matter decisions to the various factors shown in Du-Pont chart also affects the profitability. “Financial decisions affect both, the size of earnings stream or profitability and riskiness of the firm. Policy decisions affect, risk and profitability.

3.6 Importance of Profitability:

Profit is a very good indicator of business performance, but the real standard of performance of a business firm cannot be judged by the absolute size of its periodic profit. For that profitability is a good device, which represent the earning of a business firm. Modern management is engaged in the task of maximizing the profit and wealth. The efficiency of management is measured by the profitability of the business; the greater is the profitability of the business, the more will be efficiency.

“An analysis of the profitability reveals as to how the position of profit stands as a result of total transactions made during the year. It need not be stressed that profitability is analyzed through the computation of profit ratios. Profitability of a
business firm is very much helpful to the management, creditors and share holders of business firm. The management of business firm has to take some crucial managerial decision like further expansion, rising of additional finance and problem of bonus and dividend payment etc. and for this purpose the management greatly rely-upon the profitability of the business firm. Moreover, management can evaluate the operational efficiency of the business firm. The creditors of a business firm are also interested in the profitability of business firm. On the basis of profitability they decide their policy regarding the business firm. The share holders are equally interested in the profitability of the company. The share holders of a business firm cannot be judged by absolute size of its periodic profit. For that profitability is good devices which represent the earning capacity of a business firm. Modern management is engaged in the task of maximizing the profits and wealth. The efficiency of management is measured by profitability of the business; the greater is the profitability reveals as to how position of profit stands as a result of total transaction mode during the year. It need not be stressed that profitability is analyzed through the computation of profit ratios. Profitability of a business firm is very much helpful to the management, creditors, and share holders of business firm. The management of a business firm has to take some crucial managerial decision like further expansion, rising of an additional finance and problem of bonus and dividend payments etc. and for this purpose the management greatly relies upon the profitability of the business firm. Moreover, management can evaluate the operational efficiency of the business firm. The creditors of a business firm are also interested in the profitability of business firm. On the basis of profitability they decided their policy regarding the business firm. The share holders are equally interested in the profitability of the company. The share holders can take the decision whether to hold their equity share in the company or not, on the basis of profitability. Thus the management, creditors and owners of the company are equally interested in the profitability of the company.

3.7 TECHNIQUES TO MEASURE PROFITABILITY:

The measurement of profitability is an essential as the earning of profit itself for a business firm. The profitability of a business firm can be evaluated or measured from number of perspectives, and there are various quantitative as well qualitative methods that can be employed for this purpose. The following measure techniques may be used to measure profitability.
(I) **RATIO ANALYSIS:**

“Ratio Analysis” is one of the prevalent and the most popular technique to measure the profitability of the business firm; it is used only primarily to gain an insight into financial and operating aspects of a business firm. Ratio analysis is the process of determining and presenting in arithmetical terms the relationship between figures and group of figures drawn from financial statements. A ratio may be defined as “the indicated quotient of two mathematical expressions” and as “the relationship between two or more things.” The term accounting ratio, is used to describe significant relationship which exist between figures shown in financial statements profit & loss account and balance sheet.

The techniques of ratio analysis involve four steps viz. determining the accounting ratio to be used, comparison of ratio with the standard set and interpretation. An analyst has to determine which ratio is to be used, and then he computes it and compares it with the standards but no such standards have been setup by the Indian industries till today. The interpretation of ratio requires careful & detailed study and sound judgment on the part of the analyst.

❖ **SIGNIFICANCE OF RATIO ANALYSIS:**

The significance of the ration analysis depends on the purpose of which it is mode by the analyst. The important paints of significance are as under.

- A useful tool in the hands of management.
- Inter firm comparison is possible.
- Trend analysis may be easier.

(II) **COMPARATIVE AND COMMON SIZE INCOME STATEMENT ANALYSIS:**

Profitability analysis is very useful on comparative basis, so, it is of paramount importance that a series of statements over a period of years should be used. Comparative and common size income statement is the simplest technique of profitability analysis. In this technique, the figure of net sales is taken equal to one hundred and the percentage of individual items is computed likewise.
(III) **TREND ANALYSIS:**
Trend analysis is immensely helpful in marking comparative study of the changes in an item of groups of items over a period of time and to make conclusions regarding the change in date. For this purpose, a base year is selected and the amount of the item relating to the base year is taken equal to a hundred and index number are computed for other years based on the amount of that item in those years.

(IV) **VALUE ADDED ANALYSIS:**
In this method two statements are prepared to show the generation of valued added and the application of value added. Value generated is computed by subtracting the total of cost of bought – in – materials and services, which is termed as gross value added.

(V) **OTHER TECHNIQUES OF MEASUREMENTS:**
Various statistical techniques are used to provide a more accurate and scientific measurement from profitability analysis. These techniques are moving average, range, standard deviation, index numbers, regression, correlation, chi-square test, F-test and analysis of time series. Diagrams and graphs are also often used in profitability analysis.

❖ **Limitations of Accounting Ratios OR Ratio Analysis:**
There are some limitations of ratio analysis even though it is an important tool of analysis of accounting figures. Decisions should be taken after proper consideration of these limitations otherwise they lead to a wrong direction.

The following are limitations of ratio analysis.

(1) **Past information:**
Accounting data used while calculating ratios are of past years. Decisions are to be taken for future. One cannot depend upon the happenings of past, as it is not necessary that the past happenings will be repeated. Therefore, management will have to consider the estimated figures of future also while taking decisions.

(2) **Information may be wrong:**
Sometimes, it so happens that the accounting data does not portray a true and fair view of state of affairs or a true view of financial position. Therefore, the ratios based
on this information may mislead us. Balance sheet provides information of the last day of accounting period. The state of affairs, shown in the balance sheet is for the last single day only. It is possible that the position may fluctuate during the year.

(3) **Effect of external factors:**

Financial result of business depends upon a number of factors e.g. general economic conditions and competitions, local factors and the policy by the management, Govt. policy, fashion, demands etc. Hence, before arriving at any opinion on the basis of ratios all such external factors must be considered.

(4) **Lake of reality:**

All the accounting statements are prepared on the basis of those economic or financial matters, which can be shown in figures and statistics or can be measured in the form of money. They do not indicate the degree of morale and discipline of employees or the efficiency or otherwise of personnel. Hence, with the help of ratios, limited results are achieved.

(5) **Managerial conservation:**

In the use of ratios, sometimes it so happens that the manager remains rigid and he sticks to the ratios. It will lead to a serious situation. For example, if the manager believes the current ratio must be 2:1, then May profitable opportunities will have to be foregone.

(6) **Inaccurate standard for comparison:**

Each and every enterprise or a firm has a different situation e.g. methods of production, efficiency, rate of depreciation, methods of depreciation etc. All these vary from firm to firm. Under these circumstances, inter-firm comparison misleads the management.

(7) **Ratios of two irrelevant figures:**

Ratios must be established between related matters. It is of no use if the ratios are found between two figures, which have to relation with each other e.g. ratio of manufacturing expenses to distribution expenses.
(8) **Lake of standard ratios:**

There are no standard ratios against which the actual ratios can be compared. The satisfactory level of various ratios may differ from time to and firm or industry to on account of different circumstances.

(9) **Single year’s ratios have limited utility:**

The utility of ratios calculated from the financial statement of one year only is limited. They must be compared with the past results and also with the results of other firms in the same industry.

(10) **Use of one ratio is not proper:**

One ratio is used and no other ratios are used, then the result will be misleading. The combined effect of a few related ratios must be considered.

(11) **Comparison with past year ratio only may misled:**

While comparing ratios of different years, it must be remember that during different years, different accounting policies might have been adopted. Price-level, fashions, competitions, Govt. policies etc. varies year by year.

(12) **Investigation is necessary:**

It must be kept in mind that accounting ratios are only a primary step in investigation. They indicate where inquiry is necessary. Therefore before taking any action on the basis of accounting ratios, an investigation must be made.

Ratio analysis suffers from a number of draw backs:

Difficulty in comparison due to

- A. Different procedures and practice followed by different firms.
- B. Different accounting periods.
- C. Every firm differs in age, size, etc.
- D. Price-level changes between two periods.
- E. Conceptual diversity.
- F. Different meaning of the terms.
- G. Accounting limitations.
- H. Several ratios to draw conclusions.
I. Ratio analysis conveys observations.
J. Ratio may be misleading.

3.8 **PROFITABILITY ANALYSIS OF CEMENT INDUSTRY:**
The profitability of cement industry in India has been analyzed from the point of view of financial management and share holders. Profitability can be measured in terms of different components of profit and loss account and balance sheet.

A financial manager is very much interested to locate and pin-point the causes which are responsible for low or high profitability. The financial manager should continuously evaluate the efficiency of its company in terms of profit. In analyzing the profitability of cement in India from the point of view of financial management, the following ratios are considered.
### 3.8.1 GROSS PROFIT RATIO:

**Table No. 3.8.1**  
**Gross Profit Ratio (In Times) In Cement industries.**  
**Under Study from – 2007-08 to 2011-12**

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Year’s</th>
<th>Ambuja Cement (Gujarat) Pvt. Ltd.</th>
<th>Sanghi Cement Pvt. Ltd. (Gujarat)</th>
<th>Dijvijay Cement Pvt. Ltd. (Gujarat)</th>
<th>Ultratech Cement Pvt. Ltd. (Gujarat)</th>
<th>Binani Cement Pvt. Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2007-2008</td>
<td>51.71</td>
<td>63.69</td>
<td>28.77</td>
<td>55.29</td>
<td>61.13</td>
</tr>
<tr>
<td>3</td>
<td>2009-2010</td>
<td>50.61</td>
<td>57.37</td>
<td>26.19</td>
<td>50.97</td>
<td>43.12</td>
</tr>
<tr>
<td>4</td>
<td>2010-2011</td>
<td>56.56</td>
<td>48.38</td>
<td>19.85</td>
<td>51.30</td>
<td>53.91</td>
</tr>
<tr>
<td>5</td>
<td>2011-2012</td>
<td>60.05</td>
<td>18.03</td>
<td>40.54</td>
<td>51.85</td>
<td>50.21</td>
</tr>
</tbody>
</table>

|       | **\(\bar{x}\)** | 53.58                             | 48.22                             | 28.45                               | 51.73                               | 53.91                    |
|       | **\(\sum_{i=1}^{n}(x_i - \bar{x})^2\)** | 205.44                           | 5.51                              | 1752.19                             | 103.97                              | 227.14                   |
|       | **\(\sum_{i=1}^{n}(x_i - \bar{x})^2\)** | 84.13                            | 1263.98                           | 227.73                              | 19.54                               | 235.38                   |

|       | **SS total variation** | **SS between + SS within** = 2294.25 + 1830.76 = 4125.01 |

**Sources:** Computed from the annual reports and account of the respective companies from 2007-2008 to 2011-2012.
**Ambuja Cement Ltd.**

Table 3.8.1 and Graph 3.8.1(A) reveal that the average gross profit ratio of study period of was more than the cement industries average i.e.53.58%. The average gross profit ratios of this industry were second highest among all selected industry.

During the study period highest ratio was 60.05%, in the year 2011-2012 and lowest ratio was 48.99%, in the year 2008-2009.

In the year 2007-2008 the ratio was 51.71% which is now increased in 2008-2009 and was 48.99% than it decreased in 2009-2010 up to 50.61%. And after than again in 2010-2011 and 2011-2012 were increased 56.56% and 60.05%.
Table 3.8.1. and Graph 3.8.1(B) reveal that the average gross profit ratio of study period was more than the norms i.e. 48.22%.

During the study period of this industry the highest ratio was 63.69%, in the year 2007-2008 and the lowest ratio was 18.03% in the year 2011-2012.

In the year 2007-2008 the ratio was 63.69%, increasing and after than decreasing year 2008-2009, 53.65%, and again increasing ratio was 2009-2010 57.37%, and again decreasing ratio 2010-2011, 2011-2012, respectively 48.38%, and 18.03%.
Table 3.8.1 and Graph 3.8.1(C) reveal that the average gross profit of study period was below than the cement industries average i.e. 28.45%.

During the study period of this industry the highest ratio was 40.54%, in the year 2011-2012 and the lowest ratio was 19.85%, in the year 2010-2011.

In the year 2007-2008 the ratio was 28.77%, which is now increased in 2008-2009, 2009-2010, 2010-2011, in the ratio was 26.90%, 26.19%, and 19.85%, and 2007-2008 in the ratio was decreased compare in the year of 2011-2012.
Ultratech Cement Pvt. Ltd.

Table 3.8.1 and Graph 3.8.1(D) reveal that the gross profit ratio of study period in this cement industry average ratio was 51.73%.

During the study period of this industry the highest ratio was 55.29%, in the year 2007-2008, and the lowest ratio was 49.26%, in the year 2008-2009.

In the year 2007-2008, increased ratio was all year and after than decreased ratio in the year 2008-2009, was 49.26%, and again increased ratio in the year 2009-2010, 2010-2011, 2011-2012, it was respective ratio was 50.97%, 51.30% and 51.85%.
Binani Cement Pvt. Ltd.

Table 3.8.1 and Graph 3.8.1(E) reveal that the gross profit ratio of study period in this cement industry average ratio was 53.91%. That is a highest ratio of all cement industries under the studied.

During the study period of this industry the highest ratio was 61.20%, in the year 2008-2009, and the lowest ratio was 43.12%, in the year 2009-2010.

In the year 2007-2008, decreased ratio 61.13%, compare with in the year 2008-2009 ratio was 61.20 increased all year and after than decreased ratio in the year 2009-2010, was 43.12%, and again increased ratio in the year 2010-2011, the ratio was 53.91% it increased and again decreased ratio 50.12 in the year, 2011-2012.
**NULL HYPOTHESIS (H₀):**
There will be no significant difference in Gross Profit ratio in selected cement industry.

**ALTERNATIVE HYPOTHESIS (H₁):**
There will be significant difference in Gross Profit ratio in selected cement industry.

**F-Test:**

\[ \bar{x} = \frac{\bar{x}_1 + \bar{x}_2 + \bar{x}_3 + \bar{x}_4 + \bar{x}_5}{k} \]

\[ = \frac{53.58 + 48.22 + 28.45 + 51.73 + 53.91}{5} \]

\[ \bar{x} = 47.17 \]

Now we work out SS between and SS within samples:

**SS between**

\[ = n_1(\bar{x}_1 - \bar{x})^2 + n_2(\bar{x}_2 - \bar{x})^2 + n_3(\bar{x}_3 - \bar{x})^2 + n_4(\bar{x}_4 - \bar{x})^2 + n_5(\bar{x}_5 - \bar{x})^2 \]

\[ = 205.44 + 5.51 + 1752.19 + 103.97 + 227.14 \]

\[ = 2294.25 \]

**SS within**

\[ = \sum (x_1 - \bar{x}_1)^2 + \sum (x_2 - \bar{x}_2)^2 + \sum (x_3 - \bar{x}_3)^2 + \sum (x_4 - \bar{x}_4)^2 + \sum (x_5 - \bar{x}_5)^2 \]

\[ = 84.13 + 1263.98 + 227.73 + 19.54 + 253.38 \]

\[ = 1830.76 \]

**SS for total variance**

\[ = SS \text{ between} + SS \text{ within} \]

\[ = 2294.25 + 1830.76 \]

\[ = 4125.01 \]
We can now set up the F-table for this problem:

<table>
<thead>
<tr>
<th>Sources of variation</th>
<th>ss</th>
<th>d.f.</th>
<th>MS</th>
<th>F-ratio</th>
<th>5% F-limit (from the F-table)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between sample</td>
<td>2294.25</td>
<td>(5 – 1) = 4</td>
<td>( \frac{2294.25}{4} = 573.56 )</td>
<td>( \frac{573.56}{91.54} = 6.27 )</td>
<td>( F(4,20) = 2.87 )</td>
</tr>
<tr>
<td>Within sample</td>
<td>1830.76</td>
<td>(25 – 5 ) =20</td>
<td>( \frac{1830.76}{20} = 91.54 )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4125.01</td>
<td>( 25 – 1 )=24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F – Test indicates that there was significant difference in the Gross Profit ratio in selected cement industries. Because the calculate value of F-test was more than the tabulate value. So, alternative hypothesis has been accepted and null hypothesis has been rejected.

The above table shows that the calculated value of \( F \) is 6.27 which is more than the table value of 2.87 at 5% level with d.f. being \( V_1 = 4 \) and \( V_2 = 20 \) and hence could have arisen due to chance. This analysis supports the alternative hypothesis of no difference is sample means.
### 3.8.2 Net Profit Ratio:

#### Table No. 3.8.2

**Net Profit Ratio (In Times) In Cement industries Under Study from – 2007-08 to 2011-12**

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Year’s</th>
<th>Ambuja Cement (Gujarat) Pvt. Ltd.</th>
<th>Sanghi Cement Pvt. Ltd. (Gujarat)</th>
<th>Digvijay Cement Pvt. Ltd. (Gujarat)</th>
<th>Ultratech Cement Pvt. Ltd. (Gujarat)</th>
<th>Binani Cement Pvt. Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2009-2010</td>
<td>17.142</td>
<td>13.338</td>
<td>0.339</td>
<td>15.523</td>
<td>7.261</td>
</tr>
</tbody>
</table>

\[
\bar{x} = \frac{\sum x_i}{n} = 10.91
\]

- \(\bar{x}\) between
- \(\bar{x}\) within

\[
\sum = n(\bar{x} - \bar{x})^2 = 590.19
\]

\[
\sum(x_i - \bar{x})^2 = 559.86
\]

SS total variation = SS between + SS within = 590.19 + 559.86 = 1150.05

**Sources:** Computed from the annual reports and account of the respective companies from 2007-2008 to 2011-2012.
Table 3.8.2 and Graph 3.8.2(A) reveal that the average net profit ratio of study period was more than the norms i.e. 16.945%. The average net profit ratios of this industry were highest among all selected industry.

During the study period of this industry the highest ratio was 22.682%, in the year 2007-2008 and the lowest ratio was 13.330 % in the year 2011-2012.

In the year 2007-2008 the ratio was continues decreased in the year 2008-2009, 2009-2010, 2010-2011, and 2011-2012, it was respectively 17.210%, 17.142%, 14.365%, and 13.330%.

A good condition of net profit ratio this industry compared with other industries but net profit margin is decreased every year’s. The good major of net profit ratio is our sales product of 15%, to 25%.

This ratio indicates are a weak position and unexpected expenditure more than incomes.
Table 3.8.2 and Graph 3.8.2(B) reveal that the average net profit ratio of study period was below than the norms i.e. 7.488%.

During the study period of this industry the highest ratio was 13.338%, in the year 2009-2010 and the lowest ratio was -3.285% in the year 2010-2011.

In the year 2007-2008 the ratio was 12.550% this is a second highest ratio in this industry and after than the decreased in the year 2008-2009, the ratio was 6.434%, and after than again increased ratio in the year 2009-2010, in 13.338%, it is the highest ratio for the study period of this industry and again decreased ratio in the year 2010-2011, in -3.850% there was very lowest ratio and again increased ratio in the year 2011-2012, it was respectively 8.406%.

A medium good condition of net profit ratio this industry compared with other industries but net profit margin is increased and decreased every year’s. The good major of net profit ratio is our sales product of 15%, to 25%.

Overall condition of this industry for net profit ratio is very lowest.
Table 3.8.2 and Graph 3.8.2(C) reveal that the average net profit ratio of study period was below than the norms i.e. 3.478%.

During the study period of this industry the highest ratio was 10.763%, in the year 2011-2012 and the lowest ratio was -5.503% in the year 2007-2008.

In the year 2007-2008 the ratio was -5.503%, this is a lowest ratio and after than the increased in the year 2008-2009, the ratio was 8.970%, this is a second highest ratio this industry and after than again decreased ratio in the year 2009-2010, in 0.339%, and again increased ratio in the year 2010-2011, in 2.823%, and again increased ratio in the year 2011-2012, it was respectively 10.763%.

A medium good condition of net profit ratio this industry compared with other industries but net profit margin is increased and decreased every year’s. The good major of net profit ratio is our sales product of 15%, to 25%.

Overall condition of this industry for net profit ratio is very lowest.

Sanghi Cement Pvt. Ltd.

Graph: 3.8.2(C) Net Profit Ratio of Digvijay Cement Pvt. Ltd,
Table 3.8.2 and Graph 3.8.2(D) reveal that the average net profit ratio of study period was below than the norms i.e. 4.601%.

During the study period of this industry the highest ratio was 18.279%, in the year 2007-2008 and the lowest ratio was 10.548% in the year 2010-2011.

In the year 2007-2008 the ratio was 18.279%, this is a highest ratio of the study period and after than the decreased in the year 2008-2009, the ratio was 15.301%, and after than again increased ratio in the year 2009-2010, in 15.523%, and again decreased ratio in the year 2010-2011, in 10.548%, and again increased ratio in the year 2011-2012, it was respectively 13.358%.

A good condition of net profit ratio this industry compared with other industries but net profit margin is increased and decreased every year’s. The good major of net profit ratio is our sales product of 15%, to 25%.

Overall condition of this industry for net profit ratio is good.
Binani Cement Pvt. Ltd.

Table 3.8.2 and Graph 3.8.2(E) reveal that the average net profit ratio of study period was below than the norms i.e. 2.004%.

During the study period of this industry the highest ratio was 18.257%, in the year 2009-2010 and the lowest ratio was 5.236% in the year 2011-2012.

In the year 2007-2008 the ratio was 14.093%, and after than the increased in the year 2008-2009, the ratio was 18.257%, this is a highest ratio of the study period in this industry and after than again decreased ratio in the year 2009-2010, in 7.261%, and again increased ratio in the year 2010-2011, in 15.174%, and again decreased ratio in the year 2011-2012, it was respectively 5.236%, this is the lowest ratio of the study period in this industry.

A medium good condition of net profit ratio this industry compared with other industries but net profit margin is increased and decreased every year’s. The good major of net profit ratio is our sales product of 15%, to 25%.

Overall condition of this industry for net profit ratio is good.
**NULL HYPOTHESIS (H₀):**
There will be no significant difference in Net Profit ratio in selected cement industry.

**ALTERNATIVE HYPOTHESIS (H₁):**
There will be significant difference in Net Profit ratio in selected cement industry.

**F-Test:**

\[
\bar{x} = \frac{\bar{x}_1 + \bar{x}_2 + \bar{x}_3 + \bar{x}_4 + \bar{x}_5}{k}
\]

\[
= \frac{16.95 + 7.49 + 3.48 + 14.60 + 12.00}{5}
\]

\[
\bar{x} = 10.91
\]

Now we work out ss between and ss within samples:

SS between = \[n_1(\bar{x}_1 - \bar{x})^2 + n_2(\bar{x}_2 - \bar{x})^2 + n_3(\bar{x}_3 - \bar{x})^2 + n_4(\bar{x}_4 - \bar{x})^2 + n_5(\bar{x}_5 - \bar{x})^2\]

\[
= 182.41 + 58.48 + 275.28 + 68.08 + 5.94
\]

\[
= 590.19
\]

SS within = \[\sum (x_1 - \bar{x}_1)^2 + \sum (x_2 - \bar{x}_2)^2 + \sum (x_3 - \bar{x}_3)^2 + \sum (x_4 - \bar{x}_4)^2 + \sum (x_5 - \bar{x}_5)^2\]

\[
= 52.82 + 177.93 + 174.17 + 33.13 + 121.81
\]

\[
= 559.86
\]

SS for total variance = SS between + SS within

\[
= 590.19 + 559.86
\]

\[
= 1150.05
\]
We can now set up the F-table for this problem:

<table>
<thead>
<tr>
<th>Sources of variation</th>
<th>ss</th>
<th>d.f.</th>
<th>MS</th>
<th>F-ratio</th>
<th>5% F-limit (from the F-table)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between sample</td>
<td>590.19</td>
<td>(5 – 1) = 4</td>
<td>590.19/4 = 147.55</td>
<td>147.55/27.99 = 5.27</td>
<td>F (4,20) = 2.87</td>
</tr>
<tr>
<td>Within sample</td>
<td>559.86</td>
<td>(25 – 5) = 20</td>
<td>559.86/20 = 27.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1150.05</td>
<td>(25 – 1) = 24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F – Test indicates that there was significant difference in the Net Profit ratio in selected cement industries. Because the calculate value of F-test was more than the tabulate value. So, alternative hypothesis has been accepted and null hypothesis has been rejected.

The above table shows that the calculated value of $F$ is 5.27 which is more than the table value of 2.87 at 5% level with d.f. being $V_1 = 4$ and $V_2 = 20$ and hence could have arisen due to chance. This analysis supports the alternative hypothesis of no difference is sample means.
3.8.3 **OPERATING PROFIT RATIO:**

**Table No. 3.8.3**  
*Operating Profit Ratio (In Times) In Cement industries Under Study from – 2007-08 to 2011-12*

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Year’s</th>
<th>Ambuja Cement (Gujarat) Pvt. Ltd.</th>
<th>Sanghi Cement Pvt. Ltd. (Gujarat)</th>
<th>Digvijay Cement Pvt. Ltd. (Gujarat)</th>
<th>Ultratech Cement Pvt. Ltd. (Gujarat)</th>
<th>Binani Cement Pvt. Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2007-2008</td>
<td>69.464</td>
<td>77.248</td>
<td>86.639</td>
<td>69.189</td>
<td>68.544</td>
</tr>
<tr>
<td>2</td>
<td>2008-2009</td>
<td>71.456</td>
<td>84.648</td>
<td>91.162</td>
<td>74.846</td>
<td>68.168</td>
</tr>
<tr>
<td>3</td>
<td>2009-2010</td>
<td>72.205</td>
<td>82.366</td>
<td>92.098</td>
<td>72.891</td>
<td>85.349</td>
</tr>
<tr>
<td>4</td>
<td>2010-2011</td>
<td>44.054</td>
<td>62.474</td>
<td>99.689</td>
<td>50.751</td>
<td>72.025</td>
</tr>
<tr>
<td>5</td>
<td>2011-2012</td>
<td>40.726</td>
<td>68.129</td>
<td>59.660</td>
<td>49.377</td>
<td>84.502</td>
</tr>
</tbody>
</table>

|     | \( \bar{x} \) | 59.581                            | 74.973                            | 85.848                              | 63.410                               | 75.716                  |
|     | **\( \bar{x} \) = 71.90** |                                  |                                  |                                     |                                      |                         |
| ss between | 758.91 | 47.12 | 973.01 | 361.25 | 72.96 | \( \sum = n(\bar{x} - \bar{x})^2 \) = 2213.25 |
| ss within  | 994.65 | 356.49 | 945.32 | 611.23 | 292.01 | \( \sum(X_i - \bar{x})^2 \) = 3199.70 |
| ss total variation | ss between + ss within = 2213.25 + 3199.70 = 5412.95 |

**Sources:** Computed from the annual reports and account of the respective companies from 2007-2008 to 2011-2012.
Table 3.8.3 and Graph 3.8.3(A) reveal that the average operating profit ratios of study period was below than the norms i.e. 59.581%.

During the study period of this industry the highest ratio was 72.205%, in the year 2009-2010 and the lowest ratio was 40.726 % in the year 2011-2012.

In the year 2007-2008 the ratio was 69.464%, and after than the increased in the year 2008-2009, the ratio was 71.456%, this is a second highest ratio of the study period in this industry and after than again increased ratio in the year 2009-2010, in 72.205%, the highest ratio of study period in this industry and again decreased ratio in the year 2010-2011, in 44.054%, and again decreased ratio in the year 2011-2012, it was respectively 40.726%, this is the lowest ratio of the study period in this industry.

A medium good condition of operating profit ratio this industry compared with other industries but operating profit margin is increased and decreased every year’s. The good major of operating profit ratio is our sales product of 80%,

Overall condition of this industry for operating profit ratio is medium good.
Table 3.8.3 and Graph 3.8.3(B) reveal that the average operating profit ratio of study period was below than the norms i.e. 74.973%.

During the study period of this industry the highest ratio was 84.648%, in the year 2008-2009 and the lowest ratio was 62.474 %, in the year 2010-2011.

In the year 2007-2008 the ratio was 77.248%, and after than the increased in the year 2008-2009, the ratio was 84.648%, this is a highest ratio of the study period in this industry and after than again decreased ratio in the year 2009-2010, in 82.366%, the second highest ratio of study period in this industry and again decreased ratio in the year 2010-2011, in 62.474%, and again increased ratio in the year 2011-2012, it was respectively 68.129%, this is the second lowest ratio of the study period in this industry.

A medium good condition of operating profit ratio this industry compared with other industries but operating profit margin is increased and decreased every year’s. The good major of operating profit ratio is our sales product of 80%.

Overall condition of this industry for operating profit ratio is good.
Table 3.8.3 and Graph 3.8.3(C) reveal that the average operating profit ratio of study period was below than the norms i.e. 85.848%.

During the study period of this industry the highest ratio was 99.689%, in the year 2010-2011 and the lowest ratio was 59.660 %, in the year 2011-2012.

In the year 2007-2008 the ratio was 86.639%, and after than the increased in the year 2008-2009, the ratio was 91.162%, after than again increased ratio in the year 2009-2010, in 92.098%, the second highest ratio of study period in this industry and again increased ratio in the year 2010-2011, in 99.689%, it was highest ratio of the study period in this industry again decreased ratio in the year 2011-2012, it was respectively 59.660%, this is the lowest ratio of the study period in this industry.

A good condition of operating profit ratio this industry compared with other industries but operating profit margin is increased every year’s. The good major of operating profit ratio is our sales product of 80%,

Overall condition of this industry for operating profit ratio is very good.
Table 3.8.3 and Graph 3.8.3(D) reveal that the average operating profit ratio of study period was below than the norms i.e. 63.410%.

During the study period of this industry the highest ratio was 72.891%, in the year 2009-2010 and the lowest ratio was 49.377 %, in the year 2011-2012.

In the year 2007-2008 the ratio was increased it was 69.189%, and after than the increased in the year 2008-2009, the ratio was 74.846%, after than again decreased ratio is continue in the year 2009-2010, in 72.891%, in the year 2010-2011, in 50.751%, in the year 2011-2012, it was respectively 49.377%, this is the lowest ratio of the study period in this industry.

A medium good condition of operating profit ratio this industry compared with other industries but operating profit margin is decreased every year’s. The good major of operating profit ratio is our sales product of 80%.

Overall condition of this industry for operating profit ratio is medium good.
Binani Cement Pvt. Ltd.

Table 3.8.3 and Graph 3.8.3(E) reveal that the average operating profit ratio of study period was below than the norms i.e. 75.716%.

During the study period of this industry the highest ratio was 85.349%, in the year 2009-2010 and the lowest ratio was 68.168%, in the year 2008-2009.

In the year 2007-2008 the ratio was increased it was 68.544%, and after than the decreased in the year 2008-2009, the ratio was 68.168%, this is the lowest ratio and after than again increased ratio in the year 2009-2010, in 85.349%, this the highest ratio of this industry and the year 2010-2011, ratio decreased was 72.025%, and again increased ratio in the year 2011-2012, it was respectively 84.502%, this is the second highest ratio of the study period in this industry.

A medium good condition of operating profit ratio this industry compared with other industries but operating profit margin is increased and decreased every year’s. The good major of operating profit ratio is our sales product of 80%,

Overall condition of this industry for operating profit ratio is medium good.
❖ **NULL HYPOTHESIS (H₀):**  
There will be no significant difference in Operating Profit ratio in selected cement industry.

❖ **ALTERNATIVE HYPOTHESIS (H₁):**  
There will be significant difference in Operating Profit ratio in selected cement industry.

❖ **F-Test:**

\[
\overline{x} = \frac{\bar{x}_1+\bar{x}_2+\bar{x}_3+\bar{x}_4+\bar{x}_5}{k}
\]

\[
= \frac{59.58+74.97+85.85+63.40+75.72}{5}
\]

\[
\overline{x} = \boxed{71.90}
\]

Now we work out ss between and ss within samples:

\[
\text{SS between} = n_1(\bar{x}_1 - \overline{x})^2 + n_2(\bar{x}_2 - \overline{x})^2 + n_3(\bar{x}_3 - \overline{x})^2 + n_4(\bar{x}_4 - \overline{x})^2 + n_5(\bar{x}_5 - \overline{x})^2
\]

\[
= 758.91 + 47.12 + 973.01 + 361.25 + 72.96
\]

\[
= \boxed{2213.25}
\]

\[
\text{SS within} = \Sigma (x_1 - \bar{x}_1)^2 + \Sigma (x_2 - \bar{x}_2)^2 + \Sigma (x_3 - \bar{x}_3)^2 + \Sigma (x_4 - \bar{x}_4)^2 + \Sigma (x_5 - \bar{x}_5)^2
\]

\[
= 994.65 + 356.49 + 945.32 + 611.23 + 292.01
\]

\[
= \boxed{3199.70}
\]

\[
\text{SS for total variance} = \text{SS between} + \text{SS within}
\]

\[
= 2213.25 + 3199.70
\]

\[
= \boxed{5412.95}
\]
We can now set up the F-table for this problem:

<table>
<thead>
<tr>
<th>Sources of variation</th>
<th>ss</th>
<th>d.f.</th>
<th>MS</th>
<th>F-ratio</th>
<th>5% F-limit (from the F-table)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between sample</td>
<td>2213.25</td>
<td>(5 – 1) = 4</td>
<td>2213.25/4 = 553.31</td>
<td>3.45</td>
<td>F (4,20) = 2.87</td>
</tr>
<tr>
<td>Within sample</td>
<td>3199.70</td>
<td>(25 – 5) = 20</td>
<td>3199.70/20 = 159.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5412.95</td>
<td>(25-1) = 24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F – Test indicates that there was significant difference in the Operating Profit ratio in selected cement industries. Because the calculate value of F- test was more than the tabulate value. So, alternative hypothesis has been accepted and null hypothesis has been rejected.

The above table shows that the calculated value of $F$ is 3.45 which is more than the table value of 2.87 at 5% level with d.f. being $V_1 = 4$ and $V_2 = 20$ and hence could have arisen due to chance. This analysis supports the alternative hypothesis of no difference is sample means.
### 3.8.4 EXPENSES RATIOS:

**Table No. 3.8.4**

*Expenses Ratios (In Times) In Cement Industries Under Study from – 2007-08 to 2011-12*

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Year’s</th>
<th>Ambuja Cement (Gujarat) Pvt. Ltd.</th>
<th>Sanghi Cement Pvt. Ltd. (Gujarat)</th>
<th>Digvijay Cement Pvt. Ltd. (Gujarat)</th>
<th>Ultratech Cement Pvt. Ltd. (Gujarat)</th>
<th>Binani Cement Pvt. Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2007-2008</td>
<td>72.884</td>
<td>69.893</td>
<td>85.701</td>
<td>69.086</td>
<td>65.876</td>
</tr>
<tr>
<td>2</td>
<td>2008-2009</td>
<td>72.139</td>
<td>72.322</td>
<td>88.148</td>
<td>74.052</td>
<td>69.876</td>
</tr>
<tr>
<td>3</td>
<td>2009-2010</td>
<td>75.502</td>
<td>75.678</td>
<td>97.800</td>
<td>71.984</td>
<td>79.896</td>
</tr>
<tr>
<td>4</td>
<td>2010-2011</td>
<td>76.222</td>
<td>85.659</td>
<td>91.907</td>
<td>80.437</td>
<td>65.878</td>
</tr>
<tr>
<td>5</td>
<td>2011-2012</td>
<td>76.648</td>
<td>80.503</td>
<td>89.069</td>
<td>77.236</td>
<td>83.501</td>
</tr>
</tbody>
</table>

**Means**

- \( \bar{x} \) = 74.678
- \( \bar{x} \) = 76.810
- \( \bar{x} \) = 90.524
- \( \bar{x} \) = 74.558
- \( \bar{x} \) = 73.004
- \( \bar{x} = 77.92 \)

**Sum of Squares**

- **Between:** \( \sum (\bar{x} - \bar{x})^2 = 1031.19 \)
- **Within:** \( \sum (X_i - \bar{x})^2 = 611.30 \)

**Total Variation**

- \( \text{ss between + ss within} = 1031.19 + 611.30 = 1642.49 \)

**Sources:** Computed from the annual reports and account of the respective companies from 2007-2008 to 2011-2012.
Table 3.8.4 and Graph 3.8.4(A) reveal that the average expenses ratio of study period was below than the norms i.e. 74.678%.

During the study period of this industry the highest ratio was 76.648%, in the year 2011-2012 and the lowest ratio was 72.139%, in the year 2008-2009.

In the year 2007-2008 the ratio was increased it was 72.884%, and after than the decreased in the year 2008-2009, the ratio was 72.139%, this is the lowest ratio and after than increased ratio is continues in the every year 2009-2010, in 75.502%, 2010-2011, ratio increased was 76.222%, and in the year 2011-2012, it was respectively 76.648%, this is the highest ratio of the study period in this industry.

A medium good condition of expenses ratio this industry compared with other industries but expenses ratio is first increased compare with 2008-09 and after than increased every year’s.

When expenses ratio is the lowest per year it is better situation of industry.
Sanghi Cement Pvt. Ltd.

Table 3.8.4 and Graph 3.8.4(B) reveal that the average expenses ratio of study period was below than the norms i.e. 76.810%.

During the study period of this industry the highest ratio was 85.659%, in the year 2010-2011 and the lowest ratio was 69.893%, in the year 2007-2008.

In the year 2007-2008 the ratio was decreased it was 69.893%, this is the lowest in the study period and after than the increased in the year 2008-2009, the ratio was 72.322%, and in the year 2009-2010, ratio was 75.678%, 2010-2011, ratio increased was 85.659%, and after decreased ratio in the year 2011-2012, it was respectively 80.503%, this is the second highest ratio of the study period in this industry.

A medium good condition of expenses ratio this industry compared with other industries but expenses ratio is first increased compare with 2008-09 and after than increased every year’s and decreased in the year 2011-12.

When expenses ratio is the lowest per year it is better situation of industry.
Table 3.8.4 and Graph 3.8.4(C) reveal that the average expenses ratio of study period was below than the norms i.e. 90.524%.

During the study period of this industry the highest ratio was 97.800%, in the year 2009-2010 and the lowest ratio was 85.701%, in the year 2007-2008.

In the year 2007-2008 the ratio was decreased it was 85.701%, this is the lowest in the study period and after than the increased in the year 2008-2009 and 2009-2010, the ratio was 88.148%, and 97.800%, and decreased ratio in the year 2010-2011 and 2011-2012, this ratio was 91.907%, and 89.069%.

A weak condition of expenses ratio this industry compared with other industries but expenses ratio is first increased compare with 2008-09 and after than increased every year’s and decreased in the year 2010-2011 and 2011-2012.

When expenses ratio is the lowest per year it is better situation of industry.
Table 3.8.4 and Graph 3.8.4(D) reveal that the average expenses ratio of study period was below than the norms i.e. 74.558%.

During the study period of this industry the highest ratio was 80.437%, in the year 2010-2011 and the lowest ratio was 69.086%, in the year 2007-2008.

In the year 2007-2008 the ratio was decreased it was 69.086%, this is the lowest in the study period and after than the increased in the year 2008-2009, the ratio was 74.052%, and again decreased in the year 2009-2010, ratio was 71.984%, 2010-2011, ratio increased was 80.437%, this is the highest ratio in the study period and after decreased ratio in the year 2011-2012, it was respectively 77.236%, this is the second highest ratio of the study period in this industry.157.673%, ratio was indicate are both years 2010-2011 and 2011-2012.

A weak condition of expenses ratio this industry compared with other industries but expenses ratio is increased and decreased every year.

When expenses ratio is the lowest per year it is better situation of industry.
Binani Cement Pvt. Ltd.

Table 3.8.4 and Graph 3.8.4(E) reveal that the average expenses ratio of study period was below than the norms i.e. 73.004%.

During the study period of this industry the highest ratio was 83.501%, in the year 2011-2012 and the lowest ratio was 65.876%, in the year 2007-2008.

In the year 2007-2008 the ratio was decreased it was 65.876%, this is the lowest in the study period and after than the increased in the year 2008-2009, the ratio was 69.876%, and again increased in the year 2009-2010, ratio was 79.896%, 2010-2011, ratio decreased was 65.878%, and after again increased ratio in the year 2011-2012, it was respectively 83.501%, this is the highest ratio of the study period in this industry.

A good condition of expenses ratio this industry compared with other industries but expenses ratio is increased and decreased every year.

When expenses ratio is the lowest per year it is better situation of industry.
**NULL HYPOTHESIS (H₀):**
There will be no significant difference in Expenses ratio in selected cement industry.

**ALTERNATIVE HYPOTHESIS (H₁):**
There will be significant difference in Expenses ratio in selected cement industry.

**F-Test:**

\[ \bar{\bar{x}} = \frac{\bar{x}_1 + \bar{x}_2 + \bar{x}_3 + \bar{x}_4 + \bar{x}_5}{k} \]

\[ = \frac{74.68 + 76.81 + 90.52 + 74.56 + 73.00}{5} \]

\[ \bar{\bar{x}} = 77.92 \]

Now we work out SS between and SS within samples:

\[ SS \text{ between} = n_1(\bar{x}_1 - \bar{\bar{x}})^2 + n_2(\bar{x}_2 - \bar{\bar{x}})^2 + n_3(\bar{x}_3 - \bar{\bar{x}})^2 + n_4(\bar{x}_4 - \bar{\bar{x}})^2 + n_5(\bar{x}_5 - \bar{\bar{x}})^2 \]

\[ = 52.49 + 6.16 + 795.06 + 56.45 + 121.03 \]

\[ = 1031.19 \]

\[ SS \text{ within} = \sum (x_1 - \bar{x}_1)^2 + \sum (x_2 - \bar{x}_2)^2 + \sum (x_3 - \bar{x}_3)^2 + \sum (x_4 - \bar{x}_4)^2 + \sum (x_5 - \bar{x}_5)^2 \]

\[ = 16.62 + 161.20 + 85.87 + 78.56 + 269.05 \]

\[ = 611.30 \]

SS for total variance = SS between + SS within

\[ = 1031.19 + 611.30 \]

\[ = 1642.49 \]
We can now set up the **F-table** for this problem:

<table>
<thead>
<tr>
<th>Sources of variation</th>
<th>ss</th>
<th>d.f.</th>
<th>MS</th>
<th>F-ratio</th>
<th>5% F-limit (from the F-table)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between sample</td>
<td>1031.19</td>
<td>(5 – 1) = 4</td>
<td>1031.19/4 = 257.80</td>
<td>257.80/30.57 = 8.43</td>
<td>F (4,20) = 2.87</td>
</tr>
<tr>
<td>Within sample</td>
<td>611.30</td>
<td>(25 – 5) = 20</td>
<td>611.30/20 = 30.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1642.49</td>
<td>(25 – 1) = 24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F – Test indicates that there was significant difference in the Expenses ratio in selected cement industries. Because the calculate value of F-test was more than the tabulate value. So, alternative hypothesis has been accepted and null hypothesis has been rejected.

The above table shows that the calculated value of $F$ is 8.43 which is more than the table value of 2.87 at 5% level with d.f. being $V_1 = 4$ and $V_2 = 20$ and hence could have arisen due to chance. This analysis supports the alternative hypothesis of no difference is sample means.
### 3.8.5 RETURN ON SHAREHOLDER’S FUND RATIO:

#### Table No. 3.8.5

*Return On Shareholder’s Fund Ratios (In Times) In Cement industries Under Study from – 2007-08 to 2011-12*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2008-2009</td>
<td>18.228</td>
<td>7.123</td>
<td>15.747</td>
<td>27.123</td>
<td>42.098</td>
</tr>
<tr>
<td>3</td>
<td>2009-2010</td>
<td>17.237</td>
<td>10.771</td>
<td>0.574</td>
<td>23.721</td>
<td>22.810</td>
</tr>
<tr>
<td>4</td>
<td>2010-2011</td>
<td>15.228</td>
<td>-3.710</td>
<td>5.144</td>
<td>13.165</td>
<td>41.756</td>
</tr>
</tbody>
</table>

\[
\bar{x} = 18.028 \\
\bar{y} = 7.818 \\
\bar{z} = -1.744 \\
\bar{w} = 24.078 \\
\bar{v} = 30.806 \\
\bar{u} = 15.800
\]

\[
\sum_{n} = n(\bar{x} - \bar{u})^2 = 3350.80 \\
\sum_{i} (x_i - \bar{x})^2 = 4152.77
\]

\[
\sum_{i} (y_i - \bar{y})^2 = 24.86 \\
\sum_{i} (z_i - \bar{z})^2 = 318.40 \\
\sum_{i} (w_i - \bar{w})^2 = 1538.25 \\
\sum_{i} (v_i - \bar{v})^2 = 342.79 \\
\sum_{i} (u_i - \bar{u})^2 = 1126.50
\]

\[
\sum_{i} (x_i - \bar{x})^2 = 3350.80 + 4152.77 = 7503.57
\]

**Sources:** Computed from the annual reports and account of the respective companies from 2007-2008 to 2011-2012.
Table 3.8.5 and Graph 3.8.5(A) reveal that the average return on shareholder’s ratio of study period was below than the norms i.e.18.028%.

During the study period of this industry the highest ratio was 24.719%, in the year 2007-2008 and the lowest ratio was 14.730%, in the year 2011-2012.

In the year 2007-2008 the ratio was increased it was 24.719%, this is the highest ratio of the study period in this industry and after than the decreased in the every year 2008-2009, the ratio was 18.228%, this is the second lowest ratio and 2009-2010, in 17.237%, 2010-2011, ratio decreased was 15.228%, and in the year 2011-2012, it was respectively 14.730%, this is the lowest ratio of the study period in this industry.

A medium good condition of return on shareholder’s fund ratio this industry compared with other industries but return on shareholder’s fund ratio is first increased compare with 2007-2008 and after than increased every year’s.

When return on shareholder’s fund ratio may be highest condition per year it is better situation of industry.
Table 3.8.5 and Graph 3.8.5(B) reveal that the average return on shareholder’s ratio of study period was below than the norms i.e. 7.818%.

During the study period of this industry the highest ratio was 15.532%, in the year 2007-2008 and the lowest ratio was -3.710%, in the year 2010-2011.

In the year 2007-2008 the ratio was increased it was 15.532%, this is the highest ratio of the study period in this industry and after that the decreased in the year 2008-2009, the ratio was 7.123%, and again increased in the year 2009-2010, the ratio was 10.771%, and again decreased ratio in the year 2010-2011, it was -3.710%, and again increased in the year 2011-2012, it was respectively 9.378%.

A medium good condition of return on shareholder’s fund ratio this industry compared with other industries but return on shareholder’s fund ratio is increased and decreased every year’s.

When return on shareholder’s fund ratio may be highest condition per year it is better situation of industry.
Table 3.8.5 and Graph 3.8.5(C) reveal that the average return on shareholder’s ratio of study period was below than the norms i.e. -1.744%.

During the study period of this industry the highest ratio was 18.341%, in the year 2011-2012 and the lowest ratio was -48.528%, in the year 2007-2008.

In the year 2007-2008 the ratio was increased it was -48.528%, this is the very lowest ratio of the study period in this industry and after than the increased in the year 2008-2009, the ratio was 15.747%, and again decreased in the year 2009-2010, the ratio was 0.574%, and again increased ratio in the year 2010-2011, it was 5.144%, and again increased in the year 2011-2012, it was respectively 18.341%, it was highest ratio of the study period in this industry.

A weak condition of return on shareholder’s fund ratio this industry compared with other industries but return on shareholder’s fund ratio is increased and decreased every year’s.

When return on shareholder’s fund ratio may be highest condition per year it is better situation of industry.
Ultratech Cement Pvt. Ltd.

Table 3.8.5 and Graph 3.8.5(D) reveal that the average return on shareholder’s ratio of study period was below than the norms i.e. 24.078%.

During the study period of this industry the highest ratio was 37.360%, in the year 2007-2008 and the lowest ratio was 13.165%, in the year 2010-2011.

In the year 2007-2008 the ratio was increased it was 37.360%, this is the highest ratio of the study period in this industry and after than the normally decreased in the year 2008-2009, the ratio was 27.123%, and again decreased in the year 2009-2010, the ratio was 23.721%, and again decreased ratio in the year 2010-2011, it was 13.165%, it was lowest in this study period and again increased in the year 2011-2012, it was respectively 19.021%,

A good condition of return on shareholder’s fund ratio this industry compared with other industries but return on shareholder’s fund ratio is first increased and after decreased every year’s.

When return on shareholder’s fund ratio may be highest condition per year it is better situation of industry.
Binani Cement Pvt. Ltd.

Table 3.8.5 and Graph 3.8.5(E) reveal that the average return on shareholder’s ratio of study period was below than the norms i.e. 30.806%.

During the study period of this industry the highest ratio was 42.098%, in the year 2008-2009 and the lowest ratio was 15.631%, in the year 2011-2012.

In the year 2007-2008 the ratio was decreased it was 31.741%, after than the increased in the year 2008-2009, the ratio was 42.098%, it was highest ratio of the study period in this industry and again decreased in the year 2009-2010, the ratio was 22.810%, and again increased ratio in the year 2010-2011, it was 41.756%, and again decreased in the year 2011-2012, it was respectively 15.631%.

A very good condition of return on shareholder’s fund ratio this industry compared with other industries but return on shareholder’s fund ratio is first decreased and after increased every year’s.

When return on shareholder’s fund ratio may be highest condition per year it is better situation of industry.
**NULL HYPOTHESIS (H₀):**

There will be no significant difference in Return on Share holder’s funds ratio in selected cement industry.

**ALTERNATIVE HYPOTHESIS (H₁):**

There will be significant difference in Return on Share holders’ funds Profit ratio in selected cement industry.

**F-Test:**

\[
\bar{x} = \frac{\bar{x}_1 + \bar{x}_2 + \bar{x}_3 + \bar{x}_4 + \bar{x}_5}{k}
\]

\[
= \frac{18.03 + 7.82 + (-1.74) + 24.08 + 30.81}{5}
\]

\[
\bar{x} = \frac{15.80}{5}
\]

Now we work out ss between and ss within samples:

SS between = \(n_1(\bar{x}_1 - \bar{x})^2 + n_2(\bar{x}_2 - \bar{x})^2 + n_3(\bar{x}_3 - \bar{x})^2 + n_4(\bar{x}_4 - \bar{x})^2 + n_5(\bar{x}_5 - \bar{x})^2\)

\[
= 24.86 + 318.40 + 1538.25 + 342.79 + 1126.50
\]

\[
= 3350.80
\]

SS within = \(\sum (x_1 - \bar{x}_1)^2 + \sum (x_2 - \bar{x}_2)^2 + \sum (x_3 - \bar{x}_3)^2 + \sum (x_4 - \bar{x}_4)^2 + \sum (x_5 - \bar{x}_5)^2\)

\[
= 64.15 + 204.04 + 3011.60 + 330.48 + 542.50
\]

\[
= 4152.77
\]

SS for total variance = SS between + SS within

\[
= 3350.80 + 4152.77
\]

\[
= 7503.57
\]
We can now set up the F-table for this problem:

<table>
<thead>
<tr>
<th>Sources of variation</th>
<th>ss</th>
<th>d.f.</th>
<th>MS</th>
<th>F-ratio</th>
<th>5% F-limit (from the F-table)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between sample</td>
<td>3350.80</td>
<td>(5 – 1) = 4</td>
<td>3350.80/4</td>
<td>837.70/207.63 = 4.03</td>
<td>F (4,20) = 2.87</td>
</tr>
<tr>
<td>Within sample</td>
<td>4152.77</td>
<td>(25 – 5) = 20</td>
<td>4152.77/20</td>
<td>207.63</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>7503.57</td>
<td>(25 – 1) = 24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F–Test indicates that there was significant difference in the Return on Share holder’s funds ratio in selected cement industries. Because the calculate value of F-test was more than the tabulate value. So, alternative hypothesis has been accepted and null hypothesis has been rejected.

The above table shows that the calculated value of $F$ is 4.03 which is more than the table value of 2.87 at 5% level with d.f. being $V_1 = 4$ and $V_2 = 20$ and hence could have arisen due to chance. This analysis supports the alternative hypothesis of no difference is sample means.
3.8.6 **RATE OF DIVIDEND (OR RETURN) ON EQUITY SHARE CAPITAL RATIOS:**

**Table No. 3.8.6**  
*Rate of Dividend (or return) on Equity Share Capital Ratios (In Times) in Cement industries Under Study from – 2007-08 to 2011-12*

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Year’s</th>
<th>Ambuja Cement (Gujarat) Pvt. Ltd.</th>
<th>Sanghi Cement Pvt. Ltd. (Gujarat)</th>
<th>Dgvijay Cement Pvt. Ltd. (Gujarat)</th>
<th>Ultratech Cement Pvt. Ltd. (Gujarat)</th>
<th>Binani Cement Pvt. Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2007-2008</td>
<td>11</td>
<td>25</td>
<td>30</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>2008-2009</td>
<td>12</td>
<td>30</td>
<td>30</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>2009-2010</td>
<td>13</td>
<td>30</td>
<td>40</td>
<td>60</td>
<td>21</td>
</tr>
<tr>
<td>4</td>
<td>2010-2011</td>
<td>16</td>
<td>40</td>
<td>40</td>
<td>60</td>
<td>35</td>
</tr>
<tr>
<td>5</td>
<td>2011-2012</td>
<td>18</td>
<td>50</td>
<td>60</td>
<td>80</td>
<td>35</td>
</tr>
</tbody>
</table>

\[
\bar{x} = 14, 35, 40, 60, 27.2, \bar{x} = 35.24
\]

\[
\text{ss between} = 2253.69, 0.30, 113.30, 3065.30, 323.33, \sum (x_i - \bar{x})^2 = 5757.92
\]

\[
\text{ss within} = 34, 400, 600, 600, 216.8, \sum (x_i - \bar{x})^2 = 1850.80
\]

\[
\text{ss total variation} = \text{ss between} + \text{ss within} = 5757.92 + 1850.80 = 7607.92
\]

**Sources:** Computed from the annual reports and account of the respective companies from 2007-2008 to 2011-2012.
Table 3.8.6 and Graph 3.8.6(A) reveal that the average rate of dividend (or return) on equity share capital ratio of study period was below than the norms i.e. 14%.

During the study period of this industry the highest ratio was 180%, in the year 2011-2012 and the lowest ratio was 110%, in the year 2007-2008.

In the year 2007-2008 the ratio was decreased it was 11%, it was lowest ratio in the study period in this industry after than the increased in every year 2008-2009, the ratio was 12%, and again increased in the year 2009-2010, the ratio was 13%, and again increased ratio in the year 2010-2011, it was 16%, and again increased in the year 2011-2012, it was respectively 18%, it was the highest ratio of the study period in this industry.

A very good condition of rate of dividend (or return) on equity share capital ratio this industry compared with other industries but rate of dividend (or return) on equity share capital ratio is first decreased and after increased every year’s.

When rate of dividend (or return) on equity share capital ratio may be highest condition per year it is better situation of industry.

Ambuja Cement Pvt. Ltd.

Table 3.8.6 and Graph 3.8.6(A) reveal that the average rate of dividend (or return) on equity share capital ratio of study period was below than the norms i.e. 14%.

During the study period of this industry the highest ratio was 180%, in the year 2011-2012 and the lowest ratio was 110%, in the year 2007-2008.

In the year 2007-2008 the ratio was decreased it was 11%, it was lowest ratio in the study period in this industry after than the increased in every year 2008-2009, the ratio was 12%, and again increased in the year 2009-2010, the ratio was 13%, and again increased ratio in the year 2010-2011, it was 16%, and again increased in the year 2011-2012, it was respectively 18%, it was the highest ratio of the study period in this industry.

A very good condition of rate of dividend (or return) on equity share capital ratio this industry compared with other industries but rate of dividend (or return) on equity share capital ratio is first decreased and after increased every year’s.

When rate of dividend (or return) on equity share capital ratio may be highest condition per year it is better situation of industry.
Table 3.8.6 and Graph 3.8.6(B) reveal that the average rate of dividend (or return) on equity share capital ratio of study period was below than the norms i.e. 35%.

During the study period of this industry the highest ratio was 50%, in the year 2011-2012 and the lowest ratio was 25%, in the year 2007-2008.

In the year 2007-2008 the ratio was decreased it was 25%, it was the lowest ratio in the study period in this industry after than the increased in every year 2008-2009, the ratio was 30%, and again in the year 2009-2010, the ratio was 30%, it was an equal ratio in the booth year and again increased ratio in the year 2010-2011, it was 40%, and again increased in the year 2011-2012, it was respectively 50%, it was the highest ratio of the study period in this industry.

A good condition of rate of dividend (or return) on equity share capital ratio this industry compared with other industries but rate of dividend (or return) on equity share capital ratio is first decreased and after increased every year’s.

When rate of dividend (or return) on equity share capital ratio may be highest condition per year it is better situation of industry.
Table 3.8.6 and Graph 3.8.6(C) reveal that the average rate of dividend (or return) on equity share capital ratio of study period was below than the norms i.e. 40%.

During the study period of this industry the highest ratio was 60%, in the year 2011-2012 and the lowest ratio was 30%, in the year 2007-2008.

In the year 2007-2008 the ratio was decreased it was 30%, after than the an equal ratio in the year 2008-2009, the ratio was 30%, it was lowest ratio in the booth year and again increased in the year 2009-2010, the ratio was 40%, and again an equal ratio in the year 2010-2011, it was 40%, and again increased in the year 2011-2012, it was respectively 60%, it was the highest ratio of the study period in this industry.

A good condition of rate of dividend (or return) on equity share capital ratio this industry compared with other industries but rate of dividend (or return) on equity share capital ratio is first decreased and after increased every year’s.

When rate of dividend (or return) on equity share capital ratio may be highest condition per year it is better situation of industry.

**Digvijay Cement Pvt. Ltd.**

Table 3.8.6 and Graph 3.8.6(C) reveal that the average rate of dividend (or return) on equity share capital ratio of study period was below than the norms i.e. 40%.
Table 3.8.6 and Graph 3.8.6(D) reveal that the average rate of dividend (or return) on equity share capital ratio of study period was below than the norms i.e. 60%.

During the study period of this industry the highest ratio was 80%, in the year 2011-2012 and the lowest ratio was 50%, in the year 2007-2008.

In the year 2007-2008 the ratio was decreased it was 50%, it was lowest ratio in the study period of this industry and after than an equal in the year 2008-2009, the ratio was 50%, and again increased in the year 2009-2010, the ratio was 60%, and again an equal ratio in the year 2010-2011, it was 60%, and again increased in the year 2011-2012, it was respectively 80%, it was the highest ratio of the study period in this industry.

A good condition of rate of dividend (or return) on equity share capital ratio this industry compared with other industries but rate of dividend (or return) on equity share capital ratio is first decreased and after increased every year’s.

When rate of dividend (or return) on equity share capital ratio may be highest condition per year it is better situation of industry.

**Ultratech Cement Pvt. Ltd.**

Table 3.8.6 and Graph 3.8.6(D) reveal that the average rate of dividend (or return) on equity share capital ratio of study period was below than the norms i.e. 60%.
Binani Cement Pvt. Ltd.

Table 3.8.6 and Graph 3.8.6(E) reveal that the average rate of dividend (or return) on equity share capital ratio of study period was below than the norms i.e. 27.20%.

During the study period of this industry the highest ratio was 35%, in the year 2010-2011 and 2011-2012 and the lowest ratio was 20%, in the year 2007-2008.

In the year 2007-2008 the ratio was decreased it was 20%, it was lowest ratio in the study period of this industry and after than increased in the year 2008-2009, the ratio was 25%, and again decreased in the year 2009-2010, the ratio was 21%, and again increased an equal ratio in the year 2010-2011, and 2011-2012 it was 35%, and again in the year 2011-2012, it was the highest ratio of the study period in this industry.

A good condition of rate of dividend (or return) on equity share capital ratio this industry compared with other industries but rate of dividend (or return) on equity share capital ratio is first decreased and after increased every year’s.

When rate of dividend (or return) on equity share capital ratio may be highest condition per year it is better situation of industry.
**NULL HYPOTHESIS** (H₀):
There will be no significant difference in Rate of Dividend (or return) on Equity Share capital ratio in selected cement industry.

**ALTERNATIVE HYPOTHESIS** (H₁):
There will be significant difference in Rate of Dividend (or return) on Equity Share capital ratio in selected cement industry.

**F-Test:**

\[
\bar{x} = \frac{\bar{x}_1 + \bar{x}_2 + \bar{x}_3 + \bar{x}_4 + \bar{x}_5}{k}
\]

\[
= \frac{14 + 35 + 40 + 60 + 27.2}{5}
\]

\[
\bar{x} = 35.24
\]

Now we work out SS between and SS within samples:

**SS between** = \( n_1 (\bar{x}_1 - \bar{x})^2 + n_2 (\bar{x}_2 - \bar{x})^2 + n_3 (\bar{x}_3 - \bar{x})^2 + n_4 (\bar{x}_4 - \bar{x})^2 + n_5 (\bar{x}_5 - \bar{x})^2 \)

\[
= 2255.69 + 0.30 + 113.30 + 3065.30 + 323.33
\]

\[
= 5757.92
\]

**SS within** = \( \sum (x_1 - \bar{x}_1)^2 + \sum (x_2 - \bar{x}_2)^2 + \sum (x_3 - \bar{x}_3)^2 + \sum (x_4 - \bar{x}_4)^2 + \sum (x_5 - \bar{x}_5)^2 \)

\[
= 34 + 400 + 600 + 600 + 216.80
\]

\[
= 1850.80
\]

**SS for total variance** = **SS between** + **SS within

\[
= 5757.92 + 1850.80
\]

\[
= 7607.92
\]
We can now set up the F-table for this problem:

<table>
<thead>
<tr>
<th>Sources of variation</th>
<th>ss</th>
<th>d.f.</th>
<th>MS</th>
<th>F-ratio</th>
<th>5% F-limit (from the F-table)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between sample</td>
<td>5757.92</td>
<td>(5 - 1) = 4</td>
<td>5757.92/4 = 1439.48</td>
<td>1439.48/92.54 = 15.55</td>
<td>F (4,20) = 2.87</td>
</tr>
<tr>
<td>Within sample</td>
<td>1850.80</td>
<td>(25 - 5) = 20</td>
<td>1850.80/20 = 92.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>7607.92</td>
<td>(25 - 1) = 24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F – Test indicates that there was significant difference in the Rate of dividend (or return) on equity share capital ratio in selected cement industries. Because the calculate value of F-test was more than the tabulate value. So, alternative hypothesis has been accepted and null hypothesis has been rejected.

The above table shows that the calculated value of F is 15.55 which is more than the table value of 2.87 at 5% level with d.f. being \(V_1 = 4\) and \(V_2 = 20\) and hence could have arisen due to chance. This analysis supports the alternative hypothesis of no difference is sample means.
3.8.7 **RATE OF RETURN ON TOTAL ASSETS RATIOS:**

**Table No. 3.8.7**  
*Rate of Return on Total Assets Ratios (In Times) In Cement industries Under Study from – 2007-08 to 2011-12*

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Year’s</th>
<th>Ambuja Cement (Gujarat) Pvt. Ltd.</th>
<th>Sanghi Cement Pvt. Ltd. (Gujarat)</th>
<th>Digvijay Cement Pvt. Ltd. (Gujarat)</th>
<th>Ultratech Cement Pvt. Ltd. (Gujarat)</th>
<th>Binani Cement Pvt. Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2009-2010</td>
<td>17.745</td>
<td>9.569</td>
<td>0.895</td>
<td>19.593</td>
<td>14.360</td>
</tr>
</tbody>
</table>

\[
\bar{x} = 18.364 \\
\overline{\bar{x}} = 18.422 \\
\bar{X} = 15.682 \\
\sum = n(\bar{x} – \bar{X})^2 = 649.43 \\
\sum (\bar{x} – \bar{x})^2 = 506.84 \\
\]

**ss total variation** = ss between + ss within = 649.43 + 506.84 = 1156.27

**Sources:** Computed from the annual reports and account of the respective companies from 2007-2008 to 2011-2012.
Table 3.8.7 and Graph 3.8.7(A) reveal that the average rate of return on total assets ratio of study period was below than the norms i.e. 18.364%.

During the study period of this industry the highest ratio was 24.059%, in the year 2007-2008 and the lowest ratio was 15.529%, in the year 2011-2012.

In the year 2007-2008 the ratio was increased it was 24.059%, it was highest ratio of the study period in this industry after than the decreased in the year 2008-2009, the ratio was 18.696%, and again decreased in the year 2009-2010, the ratio was 17.745%, and again decreased ratio in the year 2010-2011, it was 15.796%, and again decreased in the year 2011-2012, it was respectively 15.529%, it was the lowest ratio of the study period in this industry.

A medium condition of rate of return on total assets ratio this industry compared with other industries but rate of return on total assets ratio is first increased and after decreased every year’s.

When rate of return on total assets ratio may be highest condition per year it is better situation of industry.
**Sanghi Cement Pvt. Ltd.**

Table 3.8.7 and Graph 3.8.7(B) reveal that the average rate of return on total assets ratio of study period was below than the norms i.e. 7.804%.

During the study period of this industry the highest ratio was 11.517%, in the year 2007-2008 and the lowest ratio was 3.875%, in the year 2011-2012.

In the year 2007-2008 the ratio was increased it was 11.517%, it was highest ratio of the study period in this industry after than the decreased in the year 2008-2009, the ratio was 7.550%, and again increased in the year 2009-2010, the ratio was 9.569%, and again decreased ratio in the year 2010-2011, it was 3.875%, it was the lowest ratio of the study period in this industry and again increased in the year 2011-2012, it was respectively 15.529%, .

A weak condition of rate of return on total assets ratio this industry compared with other industries but rate of return on total assets ratio is first increased and after decreased every year’s.

When rate of return on total assets ratio may be highest condition per year it is better situation of industry.
Table 3.8.7 and Graph 3.8.7(C) reveal that the average rate of return on total assets ratio of study period was below than the norms i.e. 6.790%.

During the study period of this industry the highest ratio was 16.541%, in the year 2011-2012 and the lowest ratio was -2.270%, in the year 2007-2008.

In the year 2007-2008 the ratio was decreased it was -2.270%, it was lowest ratio of the study period in this industry after than the increased in the year 2008-2009, the ratio was 13.850%, and again decreased in the year 2009-2010, the ratio was 0.895%, and again increased ratio in the year 2010-2011, it was 4.937%, and again increased in the year 2011-2012, it was respectively 16.541%, it was highest ratio of the study period in this industry.

A weak condition of rate of return on total assets ratio this industry compared with other industries but rate of return on total assets ratio is first decreased and increased every year’s.

When rate of return on total assets ratio may be highest condition per year it is better situation of industry.
Table 3.8.7 and Graph 3.8.7(D) reveal that the average rate of return on total assets ratio of study period was below than the norms i.e. 18.422%.

During the study period of this industry the highest ratio was 24.551%, in the year 2007-2008 and the lowest ratio was 12.606%, in the year 2010-2011.

In the year 2007-2008 the ratio was decreased it was 24.551%, it was highest ratio of the study period in this industry after than the decreased in the year 2008-2009, the ratio was 19.344%, and again increased in the year 2009-2010, the ratio was 19.593%, and again decreased ratio in the year 2010-2011, it was 12.606%, it was the lowest ratio of study period in this industry and again increased in the year 2011-2012, it was respectively 16.019%.

A good condition of rate of return on total assets ratio this industry compared with other industries but rate of return on total assets ratio is first decreased and increased every year’s.

When rate of return on total assets ratio may be highest condition per year it is better situation of industry.
Binani Cement Pvt. Ltd.

Table 3.8.7 and Graph 3.8.7(E) reveal that the average rate of return on total assets ratio of study period was below than the norms i.e. 15.682%.

During the study period of this industry the highest ratio was 21.735%, in the year 2010-2011 and the lowest ratio was 10.688%, in the year 2011-2012.

In the year 2007-2008 the ratio was decreased it was 12.923%, and after than the increased in the year 2008-2009, the ratio was 18.709%, and again decreased in the year 2009-2010, the ratio was 14.360%, and again increased ratio in the year 2010-2011, it was 21.735%, it was the highest ratio of study period in this industry and again decreased in the year 2011-2012, it was respectively 10.688%.

A medium good condition of rate of return on total assets ratio this industry compared with other industries but rate of return on total assets ratio is first decreased and increased every year’s.

When rate of return on total assets ratio may be highest condition per year it is better situation of industry.
**NULL HYPOTHESIS (H₀):**
There will be no significant difference in Rate of Return on Total Assets ratio in selected cement industry.

**ALTERNATIVE HYPOTHESIS (H₁):**
There will be significant difference in Rate of Return on Total Assets ratio in selected cement industry.

**F-Test:**

\[
\bar{x} = \frac{\bar{x}_1 + \bar{x}_2 + \bar{x}_3 + \bar{x}_4 + \bar{x}_5}{k}
\]

\[
= \frac{18.36 + 7.80 + 6.81 + 18.42 + 15.68}{5}
\]

\[
\bar{x} = 13.42
\]

Now we work out ss between and ss within samples:

SS between = \( n_1(\bar{x}_1 - \bar{x})^2 + n_2(\bar{x}_2 - \bar{x})^2 + n_3(\bar{x}_3 - \bar{x})^2 + n_4(\bar{x}_4 - \bar{x})^2 + n_5(\bar{x}_5 - \bar{x})^2 \)

\[
= 122.51 + 157.92 + 218.46 + 125 + 25.54
\]

\[
= 649.43
\]

SS within = \( \sum (x_1 - \bar{x}_1)^2 + \sum (x_2 - \bar{x}_2)^2 + \sum (x_3 - \bar{x}_3)^2 + \sum (x_4 - \bar{x}_4)^2 + \sum (x_5 - \bar{x}_5)^2 \)

\[
= 47.56 + 34.10 + 265.20 + 79.89 + 80.09
\]

\[
= 506.84
\]

SS for total variance = SS between + SS within

\[
= 649.43 + 506.84
\]

\[
= 1156.27
\]
We can now set up the F-table for this problem:

<table>
<thead>
<tr>
<th>Sources of variation</th>
<th>ss</th>
<th>d.f.</th>
<th>MS</th>
<th>F-ratio</th>
<th>5% F-limit (from the F-table)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between sample</td>
<td>649.43</td>
<td>(5 – 1) = 4</td>
<td>649.43/4 = 162.36</td>
<td>162.36/25.34 = 6.40</td>
<td>F (4,20) = 2.87</td>
</tr>
<tr>
<td>Within sample</td>
<td>506.84</td>
<td>(25 – 5) = 20</td>
<td>506.84/20 = 25.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1156.27</td>
<td>(25 – 1) = 24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F – Test indicates that there was significant difference in the Rate of Return on Total Assets ratio in selected cement industries. Because the calculate value of F-test was more than the tabulate value. So, alternative hypothesis has been accepted and null hypothesis has been rejected.

The above table shows that the calculated value of $F$ is 6.40 which is more than the table value of 2.87 at 5% level with d.f. being $V_1 = 4$ and $V_2 = 20$ and hence could have arisen due to chance. This analysis supports the alternative hypothesis of no difference is sample means.
3.8.8 RATE OF RETURN ON CAPITAL EMPLOYED RATIOS (ROCE):

Table No. 3.8.8
Rate of Return on Capital Employed (ROCE) Ratios (In Times) In Cement industries
Under Study from – 2007-08 to 2011-12

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Year’s</th>
<th>Ambuja Cement (Gujarat) Pvt. Ltd.</th>
<th>Sanghi Cement Pvt. Ltd. (Gujarat)</th>
<th>Digvijay Cement Pvt. Ltd. (Gujarat)</th>
<th>Ultratech Cement Pvt. Ltd. (Gujarat)</th>
<th>Binani Cement Pvt. Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2007-2008</td>
<td>37.780</td>
<td>17.017</td>
<td>-5.887</td>
<td>41.153</td>
<td>23.858</td>
</tr>
<tr>
<td>5</td>
<td>2011-2012</td>
<td>28.764</td>
<td>11.950</td>
<td>24.233</td>
<td>27.113</td>
<td>15.716</td>
</tr>
</tbody>
</table>

|    | \( \bar{x} \) | 30.686                            | 12.028                            | 10.140                              | 30.988                               | 25.996                 |
|    | ss between   | 396.05                            | 476.29                            | 678.61                              | 423.20                               | 54.78                  |
|    | ss within    | 74.39                             | 37.58                             | 511.27                              | 222.30                               | 230.79                 |

\[ \text{ss between} + \text{ss within} = 2028.93 + 1076.33 = 3105.26 \]

Sources: Computed from the annual reports and account of the respective companies from 2007-2008 to 2011-2012.
Ambuja Cement Pvt. Ltd.

Table 3.8.8 and Graph 3.8.8(A) reveal that the average rate of return on capital employed ratio of study period was below than the norms i.e. 30.686%.

During the study period of this industry the highest ratio was 37.780%, in the year 2007-2008 and the lowest ratio was 27.127%, in the year 2010-2011.

In the year 2007-2008 the ratio was increased it was 37.780%, it was highest ratio of the study period in this industry and after than the decreased in the year 2008-2009, the ratio was 31.708%, and again decreased in the year 2009-2010, the ratio was 28.054%, and again decreased ratio in the year 2010-2011, it was 27.127%, it was the lowest ratio of study period in this industry and again increased in the year 2011-2012, it was respectively 28.764%,

A good condition of rate of return on capital employed ratio this industry compared with other industries but rate of return on capital employed ratio is first increased and decreased every year’s at last this ratio again increased.

When rate of return on capital employed ratio may be highest condition per year it is better situation of industry. This ratio indicates the overall business efficiency and profitability.
Table 3.8.8 and Graph 3.8.8(B) reveal that the average rate of return on capital employed ratio of study period was below than the norms i.e. 12.029%.

During the study period of this industry the highest ratio was 17.017%, in the year 2007-2008 and the lowest ratio was 8.992%, in the year 2010-2011.

In the year 2007-2008 the ratio was increased it was 17.017%, it was highest ratio of the study period in this industry and after than the decreased in the year 2008-2009, the ratio was 12.020%, and again decreased in the year 2009-2010, the ratio was 10.165%, and again decreased ratio in the year 2010-2011, it was 8.992%, it was the lowest ratio of study period in this industry and again increased in the year 2011-2012, it was respectively 11.950%.

A weak condition of rate of return on capital employed ratio this industry compared with other industries but rate of return on capital employed ratio is first increased and decreased every year’s at last this ratio again increased.

When rate of return on capital employed ratio may be highest condition per year it is better situation of industry. This ratio indicates the overall business efficiency and profitability.
Table 3.8.8 and Graph 3.8.8(C) reveal that the average rate of return on capital employed ratio of study period was below than the norms i.e.10.140 %.

During the study period of this industry the highest ratio was 24.233%, in the year 2011-2012 and the lowest ratio was -5.887%, in the year 2007-2008.

In the year 2007-2008 the ratio was decreased it was -5.887%, it was lowest ratio of the study period in this industry and after than the increased in the year 2008-2009, the ratio was 16.573%, and again decreased in the year 2009-2010, the ratio was 6.421%, and again increased ratio in the year 2010-2011, it was 9.369%, and again increased in the year 2011-2012, it was respectively 24.233%, it was the highest ratio of the study period in this industry.

A weak condition of rate of return on capital employed ratio this industry compared with other industries but rate of return on capital employed ratio is first increased and decreased every year’s at last this ratio again increased.

When rate of return on capital employed ratio may be highest condition per year it is better situation of industry. This ratio indicates the overall business efficiency and profitability.
Ultratech Cement Pvt. Ltd.

Table 3.8.8 and Graph 3.8.8(D) reveal that the average rate of return on capital employed ratio of study period was below than the norms i.e. 30.988%.

During the study period of this industry the highest ratio was 41.153%, in the year 2007-2008 and the lowest ratio was 21.212%, in the year 2010-2011.

In the year 2007-2008 the ratio was increased it was 41.153%, it was highest ratio of the study period in this industry and after than the decreased in the year 2008-2009, the ratio was 31.661%, and again increased in the year 2009-2010, the ratio was 33.804%, and again decreased ratio in the year 2010-2011, it was 21.212%, it was the lowest ratio of study period in this industry and again increased in the year 2011-2012, it was respectively 27.113%,

A good condition of rate of return on capital employed ratio this industry compared with other industries but rate of return on capital employed ratio is first increased and decreased every year’s at last this ratio again increased.

When rate of return on capital employed ratio may be highest condition per year it is better situation of industry. This ratio indicates the overall business efficiency and profitability.
Table 3.8.8 and Graph 3.8.8(E) reveal that the average rate of return on capital employed ratio of study period was below the norms i.e. 25.996%.

During the study period of this industry the highest ratio was 36.061%, in the year 2010-2011 and the lowest ratio was 15.716%, in the year 2011-2012.

In the year 2007-2008 the ratio was decreased it was 23.858%, and after than the increased in the year 2008-2009, the ratio was 29.669%, and again decreased in the year 2009-2010, the ratio was 24.683%, and again increased ratio in the year 2010-2011, it was 36.061%, it was the highest ratio of study period in this industry and again decreased in the year 2011-2012, it was respectively 15.716%, it was the lowest ratio of the study period of this industry.

A good condition of rate of return on capital employed ratio this industry compared with other industries but rate of return on capital employed ratio is first increased and decreased every year’s at last this ratio again increased.

When rate of return on capital employed ratio may be highest condition per year it is better situation of industry. This ratio indicates the overall business efficiency and profitability.
 **NULL HYPOTHESIS (H₀):**
There will be no significant difference in Rate of Return on Capital Employed ratio in selected cement industry.

 **ALTERNATIVE HYPOTHESIS (H₁):**
There will be significant difference in Rate of Return on Capital Employed ratio in selected cement industry.

 **F-Test:**

\[
\bar{x} = \frac{\bar{x}_1 + \bar{x}_2 + \bar{x}_3 + \bar{x}_4 + \bar{x}_5}{k}
\]

\[
= \frac{30.69 + 12.03 + 10.14 + 30.99 + 25.10}{5}
\]

\[
\bar{x} = 21.79
\]

Now we work out ss between and ss within samples:

SS between\(= \) \(n_1(\bar{x}_1 - \bar{x})^2 + n_2(\bar{x}_2 - \bar{x})^2 + n_3(\bar{x}_3 - \bar{x})^2 + n_4(\bar{x}_4 - \bar{x})^2 + n_5(\bar{x}_5 - \bar{x})^2\)

\[
= 396.05 + 476.29 + 678.61 + 423.20 + 54.78
\]

\[
= 2028.93
\]

SS within \(= \sum (x_1 - \bar{x}_1)^2 + \sum (x_2 - \bar{x}_2)^2 + \sum (x_3 - \bar{x}_3)^2 + \sum (x_4 - \bar{x}_4)^2 + \sum (x_5 - \bar{x}_5)^2\)

\[
= 74.39 + 37.58 + 511.27 + 222.30 + 230.79
\]

\[
= 1076.33
\]

SS for total variance \(= \) SS between \(+ \) SS within

\[
= 2028.93 + 1076.33
\]

\[
= 3105.26
\]
We can now set up the F-table for this problem:

<table>
<thead>
<tr>
<th>Sources of variation</th>
<th>ss</th>
<th>d.f.</th>
<th>MS</th>
<th>F-ratio</th>
<th>5% F-limit (from the F-table)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between sample</td>
<td>2028.93</td>
<td>(5 – 1) = 4</td>
<td>2028.93/4</td>
<td>507.23/53.81</td>
<td>9.42 = 2.87</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>507.23/53.81</td>
<td>9.42 = 2.87</td>
</tr>
<tr>
<td>Within sample</td>
<td>1076.33</td>
<td>(25 – 5) = 20</td>
<td>1076.33/20</td>
<td>53.81</td>
<td>53.81</td>
</tr>
<tr>
<td>Total</td>
<td>3105.26</td>
<td>(25 – 1) = 24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F – Test indicates that there was significant difference in the Rate of Return on Capital Employed ratio in selected cement industries. Because the calculate value of F–test was more than the tabulate value. So, alternative hypothesis has been accepted and null hypothesis has been rejected.

The above table shows that the calculated value of F is 9.42 which is more than the table value of 2.87 at 5% level with d.f. being V₁ = 4 and V₂ = 20 and hence could have arisen due to chance. This analysis supports the alternative hypothesis of no difference is sample means.
### 3.8.9 EARNING PER SHARE (E.P.S) RATIOS:

**Table No. 3.8.9**

*Earnings Per Share (E.P.S) Ratios (In Times) In Cement industries Under Study from – 2007-08 to 2011-12*

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Year’s</th>
<th>Ambuja Cement (Gujarat) Pvt. Ltd.</th>
<th>Sanghi Cement Pvt. Ltd. (Gujarat)</th>
<th>Digvijay Cement Pvt. Ltd. (Gujarat)</th>
<th>Ultratech Cement Pvt. Ltd. (Gujarat)</th>
<th>Binani Cement Pvt. Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2007-2008</td>
<td>9.210</td>
<td>4.840</td>
<td>-0.990</td>
<td>80.940</td>
<td>2.710</td>
</tr>
<tr>
<td>2</td>
<td>2008-2009</td>
<td>8.000</td>
<td>2.390</td>
<td>1.530</td>
<td>78.480</td>
<td>8.660</td>
</tr>
<tr>
<td>3</td>
<td>2009-2010</td>
<td>2.260</td>
<td>4.050</td>
<td>0.070</td>
<td>87.820</td>
<td>5.350</td>
</tr>
<tr>
<td>4</td>
<td>2010-2011</td>
<td>8.010</td>
<td>-1.340</td>
<td>0.670</td>
<td>51.240</td>
<td>13.880</td>
</tr>
<tr>
<td>5</td>
<td>2011-2012</td>
<td>8.410</td>
<td>3.720</td>
<td>2.920</td>
<td>89.260</td>
<td>4.800</td>
</tr>
</tbody>
</table>

\[
\bar{x} = 7.178, \quad 2.732, \quad 0.840, \quad 77.540, \quad 7.080, \quad \bar{x} = 19.08
\]

\[
\text{ss between} = 708.05, \quad 1336.61, \quad 1663.49, \quad 17093.7, \quad 720, \quad \sum = n(\bar{x} - \bar{x})^2 = 21521.85
\]

\[
\text{ss within} = 31.19, \quad 23.85, \quad 8.78, \quad 947.16, \quad 76.01, \quad \sum(\bar{x} - \bar{x})^2 = 1113.99
\]

\[
\text{ss total variation} = \text{ss between} + \text{ss within} = 21521.85 + 1113.99 = 22635.84
\]

**Sources:** Computed from the annual reports and account of the respective companies from 2007-2008 to 2011-2012.
Table 3.8.9 and Graph 3.8.9(A) reveal that the average earnings per share (E.P.S) ratios of study period were below than the norms i.e. 7.178%.

During the study period of this industry the highest ratio was 9.210%, in the year 2007-2008 and the lowest ratio was 2.260%, in the year 2009-2010.

In the year 2007-2008 the ratio was increased it was 9.210%, it was highest ratio of the study period in this industry and after than the decreased in the year 2008-2009, the ratio was 8.00%, and again decreased in the year 2009-2010, the ratio was 2.260%, it was lowest ratio of the study period in this industry and again increased ratio in the year 2010-2011, it was 8.010%, and again increased in the year 2011-2012, it was respectively 8.410%.

A medium good condition of earnings per share (E.P.S) ratio this industry compared with other industries but earnings per share (E.P.S) ratio is first increased and decreased every year’s at last this ratio again increased.

When earnings per share (E.P.S) ratio may be highest condition per year it is better situation of industry. This ratio indicates the overall business efficiency and profitability.
Table 3.8.9 and Graph 3.8.9(B) reveal that the average earnings per share (E.P.S) ratio of study period were below than the norms i.e. 2.732%.

During the study period of this industry the highest ratio was 4.840%, in the year 2007-2008 and the lowest ratio was -1.340%, in the year 2010-2011.

In the year 2007-2008 the ratio was increased it was 4.840%, it was highest ratio of the study period in this industry and after than the decreased in the year 2008-2009, the ratio was 2.390%, and again increased in the year 2009-2010, the ratio was 4.050%, and again decreased ratio in the year 2010-2011, it was -1.340%, it was lowest ratio of the study period in this industry and again increased in the year 2011-2012, it was respectively 3.720%.

A weak condition of earnings per share (E.P.S) ratio this industry compared with other industries but earnings per share (E.P.S) ratio is first increased and decreased every year’s at last this ratio again increased.

When earnings per share (E.P.S) ratio may be highest condition per year it is better situation of industry. This ratio indicates the overall business efficiency and profitability.
Table 3.8.9 and Graph 3.8.9(C) reveal that the average earnings per share (E.P.S) ratio of study period were below than the norms i.e. 6.840%.

During the study period of this industry the highest ratio was 2.920%, in the year 2011-2012 and the lowest ratio was -0.990%, in the year 2007-2008.

In the year 2007-2008 the ratio was increased it was -0.990%, it was lowest ratio of the study period in this industry and after than the increased in the year 2008-2009, the ratio was 1.530%, and again decreased in the year 2009-2010, the ratio was 0.070%, and again increased ratio in the year 2010-2011, it was 0.670%, and again increased in the year 2011-2012, it was respectively 2.920%, it was highest ratio of the study period in this industry.

A weak condition of earnings per share (E.P.S) ratio this industry compared with other industries but earnings per share (E.P.S) ratio is first increased and decreased every year’s at last this ratio again increased.

When earnings per share (E.P.S) ratio may be highest condition per year it is better situation of industry. This ratio indicates the overall business efficiency and profitability.

---

**Digvijay Cement Pvt. Ltd.**

Table 3.8.9 and Graph 3.8.9(C) reveal that the average earnings per share (E.P.S) ratio of study period were below than the norms i.e. 6.840%.

During the study period of this industry the highest ratio was 2.920%, in the year 2011-2012 and the lowest ratio was -0.990%, in the year 2007-2008.

In the year 2007-2008 the ratio was increased it was -0.990%, it was lowest ratio of the study period in this industry and after than the increased in the year 2008-2009, the ratio was 1.530%, and again decreased in the year 2009-2010, the ratio was 0.070%, and again increased ratio in the year 2010-2011, it was 0.670%, and again increased in the year 2011-2012, it was respectively 2.920%, it was highest ratio of the study period in this industry.

A weak condition of earnings per share (E.P.S) ratio this industry compared with other industries but earnings per share (E.P.S) ratio is first increased and decreased every year’s at last this ratio again increased.

When earnings per share (E.P.S) ratio may be highest condition per year it is better situation of industry. This ratio indicates the overall business efficiency and profitability.
Table 3.8.9 and Graph 3.8.9(D) reveal that the average earnings per share (E.P.S) ratio of study period were below than the norms i.e. 77.54%.

During the study period of this industry the highest ratio was 89.260%, in the year 2011-2012 and the lowest ratio was 51.240%, in the year 2010-2011.

In the year 2007-2008 the ratio was increased it was 80.940%, and after than the decreased in the year 2008-2009, the ratio was 78.480%, and again increased in the year 2009-2010, the ratio was 87.820%, and again decreased ratio in the year 2010-2011, it was 51.240%, it was the lowest ratio of the study period in this industry and again increased in the year 2011-2012, it was respectively 89.260%, it was highest ratio of the study period in this industry.

A good condition of earnings per share (E.P.S) ratio this industry compared with other industries but earnings per share (E.P.S) ratio is first increased and decreased every year’s at last this ratio again increased.

When earnings per share (E.P.S) ratio may be highest condition per year it is better situation of industry. This ratio indicates the overall business efficiency and profitability.
Table 3.8.9 and Graph 3.8.9(E) reveal that the average earnings per share (E.P.S) ratio of study period were below than the norms i.e. 7.080%.

During the study period of this industry the highest ratio was 13.880%, in the year 2010-2011 and the lowest ratio was 2.710%, in the year 2007-2008.

In the year 2007-2008 the ratio was decreased it was 2.710%, it was lowest ratio of the study period in this industry and after than the increased in the year 2008-2009, the ratio was 8.660%, and again decreased in the year 2009-2010, the ratio was 5.350%, and again increased ratio in the year 2010-2011, it was 13.880%, it was the highest ratio of the study period in this industry and again decreased in the year 2011-2012, it was respectively 4.800%.

A weak condition of earnings per share (E.P.S) ratio this industry compared with other industries but earnings per share (E.P.S) ratio is first increased and decreased every year’s at last this ratio again increased.

When earnings per share (E.P.S) ratio may be highest condition per year it is better situation of industry. This ratio indicates the overall business efficiency and profitability.

Binani Cement Pvt. Ltd.

Graph: 3.8.9(E) Earnings Per Share (E.P.S) Ratio of Binani Cement Pvt. Ltd.
**NULL HYPOTHESIS (H₀):**
There will be no significant difference in Earnings per Share (E.P.S) ratio in selected cement industry.

**ALTERNATIVE HYPOTHESIS (H₁):**
There will be significant difference in Earnings per Share (E.P.S) ratio in selected cement industry.

**F-Test:**

\[
\bar{x} = \frac{\bar{x}_1 + \bar{x}_2 + \bar{x}_3 + \bar{x}_4 + \bar{x}_5}{k}
\]

\[
\bar{x} = \frac{7.18 + 2.73 + 0.84 + 77.54 + 7.08}{5} = 19.08
\]

Now we work out ss between and ss within samples:

**SS between** = \( n_1(\bar{x}_1 - \bar{x})^2 + n_2(\bar{x}_2 - \bar{x})^2 + n_3(\bar{x}_3 - \bar{x})^2 + n_4(\bar{x}_4 - \bar{x})^2 + n_5(\bar{x}_5 - \bar{x})^2 \)

\[
= 708.05 + 1336.61 + 1663.49 + 17093.70 + 720.00 = 21521.85
\]

**SS within** = \( \sum (x_1 - \bar{x}_1)^2 + \sum (x_2 - \bar{x}_2)^2 + \sum (x_3 - \bar{x}_3)^2 + \sum (x_4 - \bar{x}_4)^2 + \sum (x_5 - \bar{x}_5)^2 \)

\[
= 31.19 + 23.85 + 8.78 + 947.16 + 76.01 = 1113.99
\]

**SS for total variance** = **SS between** + **SS within**

\[
= 21521.85 + 1113.99 = 22635.84
\]
We can now set up the **F**- **table** for this problem:

<table>
<thead>
<tr>
<th>Sources of variation</th>
<th>$S_s$</th>
<th>d.f.</th>
<th>MS</th>
<th>F-ratio</th>
<th>$5%$ F-limit (from the F-table)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between sample</td>
<td>21521.85</td>
<td>$(5–1)=4$</td>
<td>$21521.85/4 = 5380.46$</td>
<td>$5380.46/95.70 = 56.22$</td>
<td>$F(4,20) = 2.87$</td>
</tr>
<tr>
<td>Within sample</td>
<td>1113.99</td>
<td>$(25–5)=20$</td>
<td>$1113.99/20 = 95.70$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>22635.84</td>
<td>$(25–1)=24$</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**F** – Test indicates that there was significant difference in the Earnings per Share (E.P.S) ratio in selected cement industries. Because the calculate value of **F**- test was more than the tabulate value. So, alternative hypothesis has been accepted and null hypothesis has been rejected.

The above table shows that the calculated value of $F$ is 56.22 which is more than the table value of 2.87 at $5\%$ level with d.f. being $V_1 = 4$ and $V_2 = 20$ and hence could have arisen due to chance. This analysis supports the alternative hypothesis of no difference is sample means.
### 3.8.10 INTEREST COVERAGE RATIO:

**Table No. 3.8.10**

*Interest Coverage Ratios (In Times) In Cement industries Under Study from – 2007-08 to 2011-12*

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Year’s</th>
<th>Ambuja Cement (Gujarat) Pvt. Ltd.</th>
<th>Sanghi Cement Pvt. Ltd. (Gujarat)</th>
<th>Digvijay Cement Pvt. Ltd. (Gujarat)</th>
<th>Ultratech Cement Pvt. Ltd. (Gujarat)</th>
<th>Binani Cement Pvt. Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2007-2008</td>
<td>52.660</td>
<td>2.340</td>
<td>44.290</td>
<td>20.850</td>
<td>7.250</td>
</tr>
<tr>
<td>3</td>
<td>2009-2010</td>
<td>32.820</td>
<td>1.280</td>
<td>44.740</td>
<td>14.970</td>
<td>4.330</td>
</tr>
<tr>
<td>4</td>
<td>2010-2011</td>
<td>33.820</td>
<td>0.520</td>
<td>34.440</td>
<td>7.540</td>
<td>7.610</td>
</tr>
</tbody>
</table>

\[
\bar{x} = 45.856 \\
\Sigma = \sum (X_i - \bar{x})^2 = 8009.89 \\
\sum(X_i - \bar{x})^2 = 2357.62
\]

**Sources:** Computed from the annual reports and account of the respective companies from 2007-2008 to 2011-2012.
Ambuja Cement Pvt. Ltd.

Table 3.8.10 and Graph 3.8.10(A) reveal that the average interest coverage ratio of study period were below than the norms i.e. 45.856%.

During the study period of this industry the highest ratio was 80.150%, in the year 2008-2009 and the lowest ratio was 29.830%, in the year 2011-2012.

In the year 2007-2008 the ratio was decreased it was 52.660%, and after than the increased in the year 2008-2009, the ratio was 80.150%, it was highest ratio of the study period in this industry and again decreased in the year 2009-2010, the ratio was 32.820%, and again increased ratio in the year 2010-2011, it was 33.820%, and again decreased in the year 2011-2012, it was respectively 29.830%, it was lowest ratio of the study period in this industry.

A medium good condition interest coverage ratio this industry compared with other industries but interest coverage ratio is first decreased and increased every year’s.

When interest coverage ratio may be highest condition per year it is better situation of industry. This ratio indicates the overall business efficiency and profitability.
Table 3.8.10 and Graph 3.8.10(B) reveal that the average interest coverage ratio of study period was below than the norms i.e. 1.982%.

During the study period of this industry the highest ratio was 3.940%, in the year 2011-2012 and the lowest ratio was 0.520%, in the year 2010-2011.

In the year 2007-2008 the ratio was increased it was 2.340%, and after than the decreased in the year 2008-2009, the ratio was 1.830%, and again decreased in the year 2009-2010, the ratio was 1.280%, and again decreased ratio in the year 2010-2011, it was 0.520%, it was the lowest ratio of the study period in this industry and again increased in the year 2011-2012, it was respectively 3.940%, it was highest ratio of the study period in this industry.

A weak condition interest coverage ratio this industry compared with other industries but interest coverage ratio is first decreased and increased every year’s.

When interest coverage ratio may be highest condition per year it is better situation of industry. This ratio indicates the overall business efficiency and profitability.
**Digvijay Cement Pvt. Ltd.**

Table 3.8.10 and Graph 3.8.10(C) reveal that the average interest coverage ratio of study period was below than the norms i.e. 39.788%.

During the study period of this industry the highest ratio was 51.160%, in the year 2011-2012 and the lowest ratio was 24.310%, in the year 2008-2009.

In the year 2007-2008 the ratio was increased it was 44.290%, and after than the decreased in the year 2008-2009, the ratio was 24.310%, and again increased in the year 2009-2010, the ratio was 44.74%, and again decreased ratio in the year 2010-2011, it was 34.44%, and again increased in the year 2011-2012, it was respectively 51.160%, it was highest ratio of the study period in this industry.

A very good condition interest coverage ratio this industry compared with other industries but interest coverage ratio is first decreased and increased every year’s.

When interest coverage ratio may be highest condition per year it is better situation of industry. This ratio indicates the overall business efficiency and profitability.
Table 3.8.10 and Graph 3.8.10(D) reveal that the average interest coverage ratio of study period was below than the norms i.e. 14.454%.

During the study period of this industry the highest ratio was 20.850%, in the year 2007-2008 and the lowest ratio was 7.54%, in the year 2010-2011.

In the year 2007-2008 the ratio was increased it was 20.850%, it was the highest ratio of the study period in this industry and after than the decreased in the year 2008-2009, the ratio was 12.750%, and again increased in the year 2009-2010, the ratio was 14.970%, and again decreased ratio in the year 2010-2011, it was 7.540%, it was the lowest ratio of the study period in this industry and again increased in the year 2011-2012, it was respectively 16.160%.

A weak condition interest coverage ratio this industry compared with other industries but interest coverage ratio is first decreased and increased every year’s.

When interest coverage ratio may be highest condition per year it is better situation of industry. This ratio indicates the overall business efficiency and profitability.

**Ultratech Cement Pvt. Ltd.**
Binani Cement Pvt. Ltd.

Table 3.8.10 and Graph 3.8.10(E) reveal that the average interest coverage ratio of study period was below than the norms i.e. 5.904%.

During the study period of this industry the highest ratio was 7.610%, in the year 2010-2011 and the lowest ratio was 2.750%, in the year 2011-2012.

In the year 2007-2008 the ratio was decreased it was 7.250%, and after than the increased in the year 2008-2009, the ratio was 7.580%, and again decreased in the year 2009-2010, the ratio was 4.330%, and again increased ratio in the year 2010-2011, it was 7.610%, it was the highest ratio of the study period in this industry and again decreased in the year 2011-2012, it was respectively 2.750%, it was the lowest ratio of the study period in this industry.

A weak condition interest coverage ratio this industry compared with other industries but interest coverage ratio is first decreased and increased every year’s.

When interest coverage ratio may be highest condition per year it is better situation of industry. This ratio indicates the overall business efficiency and profitability.
NULL HYPOTHESIS (H₀):
There will be no significant difference in Interest Coverage ratio in selected cement industry.

ALTERNATIVE HYPOTHESIS (H₁):
There will be significant difference in Interest Coverage ratio in selected cement industry.

F-Test:

\[
\bar{x} = \frac{\bar{x}_1 + \bar{x}_2 + \bar{x}_3 + \bar{x}_4 + \bar{x}_5}{k} = \frac{45.86 + 19.8 + 39.79 + 14.45 + 5.90}{5} = \frac{80.14}{5} = 16.03
\]

Now we work out ss between and ss within samples:

**SS between** = \( n_1(\bar{x}_1 - \bar{x})^2 + n_2(\bar{x}_2 - \bar{x})^2 + n_3(\bar{x}_3 - \bar{x})^2 + n_4(\bar{x}_4 - \bar{x})^2 + n_5(\bar{x}_5 - \bar{x})^2 \)

\[
= 2942.73 + 1924.72 + 1654.38 + 255.61 + 1234.45
= 8009.89
\]

**SS within** = \( \sum (x_1 - \bar{x}_1)^2 + \sum (x_2 - \bar{x}_2)^2 + \sum (x_3 - \bar{x}_3)^2 + \sum (x_4 - \bar{x}_4)^2 + \sum (x_5 - \bar{x}_5)^2 \)

\[
= 1794 + 6.61 + 442.28 + 94.79 + 19.94
= 2357.62
\]

**SS for total variance** = **SS between** + **SS within

\[
= 8009.89 + 2357.62
= 10367.51
\]
We can now set up the **F-table** for this problem:

<table>
<thead>
<tr>
<th>Sources of variation</th>
<th>ss</th>
<th>d.f.</th>
<th>MS</th>
<th>F-ratio</th>
<th>5% F-limit (from the F-table)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within sample</td>
<td>2357.62</td>
<td>(25 – 5 = 20)</td>
<td>2357.62/20 = 117.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>10367.51</td>
<td>(25 – 1) = 24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F–Test indicates that there was significant difference in the Interest Coverage ratio in selected cement industries. Because the calculate value of F-test was more than the tabulate value. So, alternative hypothesis has been accepted and null hypothesis has been rejected.

The above table shows that the calculated value of F is 16.99 which is more than the table value of 2.87 at 5% level with d.f. being $V_1 = 4$ and $V_2 = 20$ and hence could have arisen due to chance. This analysis supports the alternative hypothesis of no difference is sample means.
REFERENCES:


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