



BASIC ACCOUNTING RATIOS



LEARNING OUTCOMES

After studying this unit, you will be able to:

- ◆ Understand the meaning of ratios.
- ◆ Know Objectives, advantages and limitations of ratios analysis.
- ◆ Learn about different types of ratios generally used in the business entities.
- ◆ Comment on the liquidity, leverage, efficiency and profitability of the business.
- ◆ Interpret the ratios for intra-firm and inter-firm comparisons of business entities.

CHAPTER OVERVIEW

Types of Ratios



1. INTRODUCTION

Financial Statements provide vital information about the financial results and financial position of a business to meet the information needs of the decision-makers. However, these financial statements do not provide analytical information to provide detailed insight into the business of entity. E.g. Profit and Loss Account shows amount of net profit, but it does not explain whether this net profit is commensurate / in line with the amount of capital invested in the business. Financial statements are meaningful presentation of financial data which needs interpretation of information at various levels. Hence, there is a need to perform certain additional calculations so as to derive meaningful information from the financial statements. In order to serve the information needs of various users of accounting information, we perform financial statement analysis by calculating various accounting ratios. Accounting ratios are an important tool of financial statements analysis. 'Financial Statements Analysis' refers to draw meaningful interpretation of financial statements for parties demanding financial information. In this analysis user oriented approach is adopted instead of following the traditional proprietary approach.

This chapter covers the technique of accounting ratios for analysing the information contained in financial statements for assessing the solvency, efficiency and profitability of the enterprises.

2. RATIO AND RATIO ANALYSIS

Let us first understand the definition of ratio and meaning of ratio analysis.

2.1 Meaning of Accounting Ratio: Ratio is mathematical relationship between two interrelated variables. It is a process of determining, interpreting and presenting numerical relationships of items and group of items in the financial statements.

Accounting Ratios are nothing but ratios that are compared on the basis of accounting information provided by financial statements.

For example, if the gross profit of the business is ₹5,000 and the 'Revenue from Operations' are ₹ 50,000, it can be said that the gross profit is 10% $[(5,000/50,000) \times 100]$ of the 'Revenue from Operations'. This ratio is termed as gross profit ratio.

2.2 Ratio Analysis: Ratio Analysis is a process of drawing meaningful interpretations from the calculated ratio and taking decisions based on the same. Ratio Analysis is an accounting tool utilized in analysis, interpreting the various items in financial statements and reporting in understandable terms to its use. Myers explained it as, "Ratio Analysis is a study of relationship among various financial factors in a business".

- ◆ Ratio Analysis is a systematic use of ratios to interpret the financial statements in order to determine the performance and financial condition of the business enterprises. The term Accounting Ratios refers to the numerical relationship between two components/items/variables of the financial statements.
- ◆ Ratio analysis can be performed on historical financial information or prospective financial information.
- ◆ Ratio analysis is based on the fact that a single accounting figure by itself may not communicate any meaningful information but when expressed as a relative to some other figure, it may definitely provide some significant information.
- ◆ Ratio analysis is not restricted to comparing different numbers from the balance sheet, income statement, and cash flow statement. It also includes comparing the number against the previous year's data, or with other entities, the industry, or even the economy in general for the purpose of financial analysis.

2.3 Expression of Ratios: Accounting ratios can be expressed in any of the following form:-

- ◆ *Pure:-* It is expressed in pure ratio form such as 2:1. Liquidity ratios and solvency ratios are generally expressed in this form.
- ◆ *Percentage:-* Ratios can be expressed in percentage format such as 10%, 40% etc. Profitability ratios are expressed in percentage forms.
- ◆ *Times:-* Ratios are also expressed in no. of times a particular figure is as compared to another figure. This is specially used to measure activity ratios.
- ◆ *Fraction:-* Ratios can be expressed in fractions such as $\frac{4}{5}$ etc.

3. OBJECTIVES OF RATIO ANALYSIS

The objectives of ratio analysis can be given as follows:

1. To know the areas of the business which need more attention.
2. To judge the earning capacity of enterprises.
3. To provide a deeper analysis of the profitability, solvency and efficiency levels in the business;
4. To provide information for making cross-sectional analysis by comparing the performance with the best industry standards; and
5. To provide information derived from financial statements useful for making projections and estimates for the future.
6. To determine the operating efficiency of business entities.

4. ADVANTAGES OF RATIO ANALYSIS

Ratio analysis is an important tool for analysing the company's financial performance. There are many advantages derived from ratio analysis. These can be summarised as follows:

- 1. Helps to understand utility of decisions:** Ratio analysis helps to appreciate whether the business firm has taken the right decision or not. It indicates how far the ratios have helped in improving the performance of the business entity.
- 2. Judgement of Liquidity Position:** Liquidity Ratios play an important role in assessing the firm's ability to meet its short-term obligations.
- 3. Assessment of Long-term Solvency:** Ratio Analysis is useful in analysing the long-term financial strength of a business entity. The role of Profitability Ratios is significant in determining such capacity of an entity.
- 4. Identification of problem areas:** Ratios help business in identifying the problem (weak) areas of the business entity.
- 5. Intra-firm Comparison and Inter-Firm Comparison:** The performance of different units belonging to the same business firm can be easily compared with Ratio Analysis. Comparison of a firm's performance with other business firms i.e. inter-firm comparison depicts entity's position against its competitors.

- 6. Trend Analysis:** To sail among the other industries, to know the direction of movement, trend analysis can render the necessary assistance.



5. LIMITATIONS OF RATIO ANALYSIS

Accounting ratios use the data given in the financial statements. Any shortcoming in the financial statement or non-compliance of any statute or standard may lead to financial statements not presenting true and fair view, which will ultimately lead to incorrect calculation of accounting ratios. Thus, the limitations of financial statements also form the limitations of the ratio analysis. Hence, to interpret the ratios, the user should be aware of the rules followed in the preparation of financial statements and also their nature and limitations. The limitations of ratio analysis which arise primarily from the nature of financial statements are as under:

- 1. Limitations of Accounting Data:** Accounting data give an unwarranted impression of precision and finality. In fact, accounting data “reflect a combination of recorded facts, accounting conventions and personal judgements which affect them materially. For example, profit of the business is not a precise and final figure. It is merely an opinion of the accountant based on application of accounting policies. The soundness of the judgement necessarily depends on the competence and integrity of those who make them and on their adherence to Generally Accepted Accounting Principles and Conventions”. If, the financial statements do not reveal the true state of affairs of the enterprises, then ratios will also not give the true picture. Reliability of ratio and its analysis depends on the correctness of financial statements. So the results obtained on the basis of any defective financial statements may also be not reliable.
- 2. Non-consideration of Fluctuation in purchasing power of money:** In inflationary economy where purchasing power of money is declining with time, comparison of accounting ratios with ratios of earlier years becomes meaningless since accounting records ignore changes in value of money. The financial accounting is based on stable money measurement principle. It implicitly assumes that price level changes are either non-existent or minimal. But the truth is otherwise. We are normally living in inflationary economies where the power of money declines constantly. A change in the price-level affects the comparability of financial ratios. Our financial statements use for measurement purpose, the base of money which is prevalent at time of preparation of financial statements and do not present information adjusting inflation.
- 3. Non-Accounting of qualitative or non-monetary Data:** As Accounting Ratios are tools of quantitative analysis, qualitative factors are ignored. Accounting provides information about quantitative (or monetary) aspects of business. Hence, the ratios also reflect only the monetary aspects, ignoring completely the non-monetary (qualitative) factors.
- 4. Variations in Accounting Practices:** Multiple variations in various accounting practices leave a big question mark on the cross-sectional analysis. As there are variations in accounting practices followed by different business enterprises, a valid comparison of their financial statements is not possible. Due to such variations among the industries, comparisons may not be easy, reliable and accurate.
- 5. Forecasting:** Forecasting of future trends based only on historical analysis is not feasible. Proper forecasting requires consideration of non-financial factors as well.
- 6. Not a Standard Yardstick:** Since there are no standard/constant practices or definitions for calculation of ratios among industry, it is difficult to evolve a common standard ratio, which is acceptable by all and comparable at all times.

6. LIMITATIONS OF THE RATIOS

The various limitations are:

1. **Means and not the End:** Ratios are means to an end rather than the end by itself.
2. **Lack of ability to resolve problems:** Their role is essentially indicative and of whistle blowing and not providing a solution to the problem.
3. **Lack of standardised definitions:** There is a lack of standardised definitions of various concepts used in ratio analysis. For example, there is no standard definition of liquid liabilities. Normally, it includes all current liabilities, but sometimes it refers to current liabilities less bank overdraft.
4. **Lack of universally accepted standard levels:** There is no universal yardstick which specifies the level of ideal ratios. There is no standard list of the levels (universally acceptable) for the ratios.

7. TYPES OF RATIOS

There is a two-way classification of ratios:

- (1) Traditional classification, and
- (2) Functional classification.

The **TRADITIONAL CLASSIFICATION** has been on the basis of financial statements to which the determinants of ratios belong. On this basis the ratios are classified as follows:

1. **Statement of Profit and Loss Ratios:** When a ratio is calculated from the two variables which are extracted from the statement of profit and loss only, it is known as statement of profit and loss ratio.
For example, ratio of gross profit to revenue from operations is known as gross profit ratio.
2. **Balance Sheet Ratios:** When a ratio is calculated by taking both variables from the balance sheet, it is classified as balance sheet ratio. For example, ratio of current assets to current liabilities is known as current ratio.
3. **Composite Ratios:** When a ratio is calculated with one variable from the statement of profit and loss and another variable from the balance sheet, it is called composite ratio.

For example, ratio of credit revenue from operations to trade receivables (known as trade receivables turnover ratio) is calculated using one figure from the statement of profit and loss (credit revenue from operations) and another figure (trade receivables) from the balance sheet.

Although accounting ratios are calculated by taking data from financial statements but classification of ratios on the basis of financial statements is rarely used in practice.

It must be recalled that basic purpose of accounting is to throw light on the financial performance (profitability) and financial position (its capacity to raise money and invest them wisely) as well as changes occurring in financial position. As such, the **FUNCTIONAL CLASSIFICATION** based on the purpose for which a ratio is computed, is the most commonly used classification which is as follows:

1. **Liquidity Ratios:** To meet its commitments, business needs liquid funds. The ability of the business to pay the amount due to stakeholders as and when it is due is known as liquidity, and the ratios calculated to measure it are known as 'Liquidity Ratios'. These are essentially short-term in nature.

2. **Solvency Ratios:** Solvency of business is determined by its ability to meet its contractual obligations towards stakeholders, particularly towards external stakeholders, and the ratios calculated to measure solvency position are known as 'Solvency Ratios'. These are essentially long-term in nature.
3. **Activity (or Turnover) Ratios:** This refers to the ratios that are calculated for measuring the efficiency of operations of business based on effective utilisation of resources. Hence, these are also known as 'Efficiency Ratios'.
4. **Profitability Ratios:** These ratios determine the profitability of the firm. For example, Gross Profit Ratio, Net Profit Ratio, Operating Profit Ratio. These ratios are generally computed with respect to sales.

7.1 Liquidity Ratios: The terms 'liquidity' and 'short-term solvency' are used synonymously.

Liquidity or short-term solvency means ability of the business to pay its short-term liabilities. Inability to pay-off short-term liabilities affects its credibility as well as its credit rating. Continuous default on the part of the business leads to commercial bankruptcy. Eventually such commercial bankruptcy may lead to its sickness and dissolution. Short-term lenders and creditors of a business are very much interested to know its state of liquidity because of their financial stake. Both lack of sufficient liquidity and excess liquidity is bad for the organization.

Various Liquidity Ratios are:

- (a) Current Ratio
- (b) Quick Ratio or Acid test Ratio
- (c) Cash Ratio or Absolute Liquidity Ratio
- (d) Net Working Capital Ratio

(a) Current Ratio: The Current Ratio is one of the best known measures of short term solvency. It is the most common measure of short-term liquidity. It measures whether Current Assets in the business are sufficient to meet Current Liabilities.

$$\text{Current Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

Where,

$$\text{Current Assets} = \text{Inventories} + \text{Sundry Debtors} + \text{Cash and Bank Balances} + \text{Receivables/} \\ \text{Accruals} + \text{Loans and Advances} + \text{Disposable Investments etc}$$

$$\text{Current Liabilities} = \text{Creditors for goods and services} + \text{Short-term Loans} + \text{Bank Overdraft} + \\ \text{Cash Credit} + \text{Outstanding Expenses} + \text{Provision for Taxation} + \text{Dividend} \\ \text{payable etc.}$$

The main question this ratio addresses is: "Does your business have enough current assets to meet the payment schedule of its current debts with a margin of safety for possible losses in current assets?"

A generally acceptable current ratio is 2:1. But whether or not a specific ratio is satisfactory depends on the nature of the business and the characteristics of its current assets and liabilities.

ILLUSTRATION 1

You are required to calculate Current Ratio from the following information:

Particulars	₹
Inventories	1,00,000
Trade receivables	1,00,000
Advance tax paid	4,000
Cash and cash equivalents	30,000
Trade payables	2,00,000
Short-term borrowings (bank overdraft)	4,000

SOLUTION

Current Ratio = Current Assets/Current Liabilities

Current Assets = Inventories + Trade receivables + Advance tax + Cash and cash equivalents
 = ₹ 1,00,000 + ₹ 1,00,000 + ₹ 4,000 + ₹ 30,000
 = ₹ 2,34,000

Current Liabilities = Trade payables + Short-term borrowings
 = ₹ 2,00,000 + ₹ 4,000
 = ₹ 2,04,000

Current Ratio = ₹ 2,34,000/ ₹ 2,04,000
 = 1.14 :1

(b) Quick Ratio: The Quick Ratio is sometimes called the "acid-test" ratio and is one of the best measures of liquidity. It is considered better than Current Asset Ratio

$$\text{Quick Ratio or Acid Test Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

Where,

Quick Assets = Current Assets – Inventories – Prepaid Expenses

Current Liabilities = As mentioned under Current Ratio.

The Quick Ratio is a much more conservative measure of short-term liquidity than the Current Ratio. It helps answer the question: "could my business meet current obligations with the readily convertible quick funds on hand?"

Quick Assets consist of only cash and near cash assets. Inventories are deducted from current assets on the belief that these are not 'near cash assets' and also because in times of financial difficulty inventory may be saleable only at liquidation value. But in a seller's market inventories are also near cash assets. Prepaid Expenses are deducted from it because these are expenses paid in advance and hence cannot be converted into Cash.

An acid-test of 1:1 is considered satisfactory unless the majority of quick assets are in accounts receivable, and the pattern of accounts receivable collection lags behind the schedule for paying current liabilities.

 **ILLUSTRATION 2**

	₹		₹
Current liabilities	1,00,000	Advance tax paid	10,000
Current assets	1,60,000	Prepaid expenses	10,000
Inventories	40,000		

You are required to calculate 'Liquidity Ratio' from the above information.

 **SOLUTION**

Liquidity Ratio = Liquid Assets/Current Liabilities

Liquidity Assets = Current assets – (Inventories + Prepaid expenses + Advance tax)

= ₹ 1,60,000 – (₹ 40,000 + ₹ 10,000 + ₹ 10,000)

= ₹ 1,00,000

Liquidity Ratio = ₹ 1,00,000/ ₹ 1,00,000

= 1 : 1

(c) Cash Ratio/Absolute Liquidity Ratio: The cash ratio measures the absolute liquidity of the business. This ratio considers only the absolute liquidity available with the firm. This ratio is calculated as:

$$\text{Cash Ratio} = \frac{\text{Cash and Bank balances} + \text{Marketable Securities}}{\text{Current Liabilities}}$$

Or,

$$\frac{\text{Cash and Bank balances} + \text{Current Investments}}{\text{Current Liabilities}}$$

The Absolute Liquidity Ratio only tests short-term liquidity in terms of cash and marketable securities/ current investments. It measures the firm's ability to pay off its liability with only cash and cash equivalents. Inventory and accounts receivables are kept out of the equation because both of these accounts are not guaranteed to be available for payment of liabilities.

 **ILLUSTRATION 3**

	₹
Cash	10,00,000
Marketable Securities	2,00,000
Accounts Payable	5,00,000
Accounts Receivables	20,00,000
Current Taxes Payable	1,00,000
Long term liabilities	10,00,000

You are required to calculate the Cash Ratio.

 **SOLUTION**

$$\text{Cash Ratio} = \frac{\text{Cash and Bank balances} + \text{Marketable Securities}}{\text{Current Liabilities (Accounts payable} + \text{Current tax payable)}}$$

$$\begin{aligned} \text{Cash Ratio} &= \frac{\text{₹ 10,00,000} + \text{₹ 2,00,000}}{\text{₹ 5,00,000} + \text{₹ 1,00,000}} \\ &= 2:1 \end{aligned}$$

(d) Net Working Capital Ratio: Net working capital is more a measure of cash flow than a ratio. The result of this calculation must be a positive number. It is calculated as shown below:

Net Working Capital Ratio = Current Assets – Current Liabilities (excluding short-term bank borrowing)

Bankers look at Net Working Capital over time to determine a company's ability to weather financial crises.

 **ILLUSTRATION 4**

Current Ratio	3:1
Current Assets	2,10,000

You are required to calculate Net Working Capital Ratio.

 **SOLUTION**

$$\begin{aligned} \text{Net Working Capital Ratio} &= \text{Current Assets} - \text{Current Liabilities} \\ &= \text{₹ 2,10,000} - \text{₹ 70,000} \\ &= \text{₹ 1,40,000} \end{aligned}$$

W.N.-1

$$\begin{aligned} \text{Current Ratio} &= \frac{\text{Current Assets}}{\text{Current Liabilities}} \\ 3:1 &= \text{₹ 2,10,000} / \text{Current Liabilities} \\ \text{Current Liabilities} &= \text{₹ 2,10,000} \div 3 \\ &= \text{₹ 70,000} \end{aligned}$$

7.2 Long-term Solvency Ratio/Leverage Ratio: The leverage ratios may be defined as those financial ratios which measure the long-term stability and structure of the firm. These ratios indicate the mix of funds provided by owners and lenders and assure the lenders of the long-term funds with regard to:

- (i) Periodic payment of interest during the period of the loan and
- (ii) Repayment of principal amount on maturity.

Leverage ratios are of two types:

1. Capital Structure Ratios

- (a) Equity Ratio
- (b) Debt to Equity Ratio
- (c) Debt to Total Assets Ratio
- (d) Capital Gearing Ratio
- (e) Proprietary Ratio

2. Coverage Ratios

- (a) Debt-Service Coverage Ratio (DSCR)
- (b) Interest Coverage Ratio
- (c) Preference Dividend Coverage Ratio
- (d) Fixed Charges Coverage Ratio

7.2.1 Capital Structure Ratios: These ratios provide an insight into the financing techniques used by a business and focus, as a consequence, on the long-term solvency position.

From the balance sheet one can get only the absolute fund employed and its sources, but only capital structure ratios show the relative weight of different sources.

Various capital structure ratios are:

(a) Equity Ratio:

$$\text{Equity Ratio} = \frac{\text{Shareholders' Equity}}{\text{Capital Employed}}$$

Where,

$$\text{Shareholder's Funds} = \text{Share Capital} + \text{General Reserve} + \text{Surplus} + \text{Retained Earnings}$$

$$\text{Capital Employed} = \text{Total Assets} - \text{Current Liabilities}$$

Or

$$\text{Fixed Assets} + \text{Working Capital}$$

This ratio indicates proportion of owners' fund to total fund invested in the business. Traditionally, it is believed that higher the proportion of owners' fund lower is the degree of risk.

 **ILLUSTRATION 5**

	₹
Share Capital	10,00,000
Reserves	2,00,000
Surplus	(50,000)
Current assets	5,00,000
Non current assets	6,00,000
Trade payables	1,20,000

You are required to compute Equity Ratio.

 **SOLUTION**

$$\begin{aligned}
 \text{Equity Ratio} &= \frac{\text{Shareholders' Equity}}{\text{Capital Employed}} \\
 &= \frac{\text{₹ 11,50,000}}{\text{₹ 9,80,000}} \\
 &= \text{₹ 1.17:1}
 \end{aligned}$$

W.N. 1:

$$\begin{aligned}
 \text{Shareholders Funds} &= \text{Share Capital} + \text{Reserves} - \text{Losses carried forward} \\
 &= \text{₹ 10,00,000} + \text{₹ 2,00,000} - \text{₹ 50,000} \\
 &= \text{₹ 11,50,000}
 \end{aligned}$$

$$\begin{aligned}
 \text{Capital Employed} &= \text{Current Assets} + \text{Non Current Assets} - \text{Trade Payables} \\
 &= \text{₹ 5,00,000} + \text{₹ 6,00,000} - \text{₹ 1,20,000} \\
 &= \text{₹ 9,80,000}
 \end{aligned}$$

(b) Debt to Equity Ratio:

Generally Used

$$\text{Debt to Equity Ratio} = \frac{\text{Long term Debts}}{\text{Shareholders' Equity}}$$

Some times, the following formula also being used; depending upon the requirement of the question.

$$\begin{aligned}
 \text{Debt to Equity Ratio} &= \frac{\text{Total Outside Liabilities}}{\text{Shareholders' Equity}} \\
 &\text{Or} \\
 &= \frac{\text{Total Debt}}{\text{Shareholders' Equity}}
 \end{aligned}$$

The shareholders' equity is equity and preference share capital + post accumulated profits (excluding fictitious assets etc).

A high debt to equity ratio here means less protection for creditors, a low ratio, on the other hand, indicates a wider safety cushion (i.e., creditors feel the owner's funds can help absorb possible losses of income and capital).

This ratio indicates the proportion of debt fund in relation to equity. This ratio is very often referred in capital structure decision as well as in the legislation dealing with the capital structure decisions (i.e. issue of shares and debentures). Lenders are also very keen to know this ratio since it shows relative weights of debt and equity. Debt equity ratio is the indicator of firm's financial leverage.

ILLUSTRATION 6

	₹
Share capital	1,50,000
Reserves and surplus	(23,000)
Long term liabilities	1,78,500
Current liabilities	18,500
Fixed assets	1,23,000
Non - current investments	26,000
Current assets	1,76,000

You are required to compute Debt to Equity Ratio from the above information.

SOLUTION

$$\text{Debt to Equity Ratio} = \frac{\text{Long term debt}}{\text{Shareholders' Equity}}$$

$$\text{Debt to Equity Ratio} = \frac{\text{₹ 1,78,500}}{\text{₹ 1,27,000}}$$

$$= 1.40:1$$

W.N. 1:

$$\text{Long term Debt} = \text{Long term liabilities}$$

$$= \text{₹ 1,78,500}$$

$$\text{Shareholder's Equity} = \text{Share Capital} + \text{Reserves and Surplus}$$

$$= \text{₹ 1,50,000} - \text{₹ 23,000}$$

$$= \text{₹ 1,27,000}$$

- (c) **Debt to Total Assets Ratio:** This ratio measures the proportion of total assets financed with debt and, therefore, the extent of financial leverage. Investors use this ratio to evaluate the overall risk of the company. Companies with higher ratio are considered more risky to invest. Thus, lower is always better.

Total debt or total outside liabilities includes short and long term borrowings from financial institutions, debentures/bonds, deferred payment arrangements for buying capital equipment's, bank borrowings, public deposits and any other interest bearing loan.

Generally used

$$\text{Debt to Total Assets Ratio} = \frac{\text{Total Debt}^*}{\text{Total Assets}}$$

$$\text{Or} = \frac{\text{Total Outside Liabilities}}{\text{Total Assets}}$$

* If nothing mentioned in the question, consider only Long-term.

$$\text{Total Assets} = \text{Current Assets} + \text{Non-Current Assets}$$

Or we can say total assets includes all assets except fictitious assets such as preliminary expenses and negative balance of profit/loss account.

ILLUSTRATION 7

In the above illustration, compute Debt to Total Assets Ratio.

SOLUTION

$$\begin{aligned} \text{Debt to Total Assets Ratio} &= \frac{\text{Total Debt}}{\text{Total Assets}} \\ &= \frac{\text{₹ 1,78,500}}{\text{₹ 3,25,000}} \\ &= 0.55 : 1 \end{aligned}$$

- (d) **Capital Gearing Ratio:** In addition to debt-equity ratio, sometimes capital gearing ratio is also calculated to show the proportion of fixed interest (dividend) bearing capital to funds belonging to equity shareholders i.e. equity funds or net worth. It analyzes the relationship between funds provided by equity shareholders and funds provided by those who are receiving a fixed interest payment.

$$\text{Capital Gearing Ratio} = \frac{(\text{Preference Share Capital} + \text{Debentures} + \text{Other Borrowed funds})}{(\text{Equity share Capital} + \text{Reserves \& Surplus} - \text{Losses})}$$

A company is said to be low geared if shareholders' funds are more than fixed interest-bearing funds and highly geared if vice-a-versa is there.

ILLUSTRATION 8

	₹
Equity share capital	9,00,000
Preference shareholders	5,00,000
10% debentures	2,00,000
Loan from bank	12,00,000
Reserves	4,00,000

You are required to compute the Capital Gearing Ratio.

SOLUTION

$$\begin{aligned}
 \text{Capital Gearing Ratio} &= \frac{(\text{Preference Share Capital} + \text{Debentures} + \text{Other Borrowed funds})}{(\text{Equity share Capital} + \text{Reserves \& Surplus} - \text{Losses})} \\
 &= \frac{\text{₹ } 5,00,000 + \text{₹ } 2,00,000 + \text{₹ } 12,00,000}{\text{₹ } 9,00,000 + \text{₹ } 4,00,000} \\
 &= \frac{\text{₹ } 19,00,000}{\text{₹ } 13,00,000} \\
 &= 19 : 13 \text{ (highly geared)}
 \end{aligned}$$

(e) Proprietary Ratio:

$$\text{Proprietary Ratio} = \frac{\text{Proprietary Fund}}{\text{Total Assets}}$$

Proprietary fund includes Equity Share Capital + Preference Share Capital + Reserve & Surplus. Total assets exclude fictitious assets and losses.

It indicates the proportion of total assets financed by shareholders whether equity or preference.

7.2.2 Coverage Ratios: The coverage ratios measure the firm's ability to service the fixed liabilities. These ratios establish the relationship between fixed claims and what is normally available out of which these claims are to be paid. The fixed claims consist of:

- (i) Interest on loans
- (ii) Preference dividend

- (iii) Amortization of principal or repayment of the instalment of loans or redemption of preference capital on maturity.

The following are important coverage ratios:

- (a) **Debt Service Coverage Ratio (DSCR):** Lenders are interested in debt service coverage to judge the firm's ability to pay off current interest and instalments.

$$\text{Debt Service Coverage Ratio} = \frac{\text{Earnings available for debt Services}^*}{\text{Interest Liabilities} + \text{Instalments}}$$

$$\begin{aligned} \text{Earning for debt service}^* &= \text{Net profit (Earning after taxes) + Non-cash operating} \\ &\quad \text{expenses like depreciation and other amortizations + Interest + other} \\ &\quad \text{adjustments like loss on sale of Fixed Asset etc.} \end{aligned}$$

- (b) **Interest Coverage Ratio:** This ratio also known as "times interest earned ratio" indicates the firm's ability to meet only the interest (and other fixed-charges) obligations. This ratio is computed as:

$$\text{Interest Coverage Ratio} = \frac{\text{Earnings before interest and taxes (EBIT)}}{\text{Interest}}$$

Earnings before interest and taxes are used in the numerator of this ratio because the ability to pay interest is not affected by tax burden as interest on debt funds is deductible expense. This ratio indicates the extent to which earnings may fall without causing any embarrassment to the firm regarding the payment of interest charges. A high interest coverage ratio means that an enterprise can easily meet its interest obligations even if earnings before interest and taxes suffer a considerable decline. A lower ratio indicates excessive use of debt or inefficient operations.

ILLUSTRATION 9

You are required to calculate:

1. Interest coverage ratio and
2. Debt Service Coverage Ratio with the help of following details:

$$\text{Net Profit after tax} = ₹ 60,000$$

$$15\% \text{ Long-term debt} = ₹ 10,00,000 \text{ (Principal amount is repayable in 20 equal installments)}$$

$$\text{Tax rate} = 40\%$$

SOLUTION

$$\begin{aligned} \text{(i) Interest Coverage Ratio} &= \frac{\text{Net Profit before Interest and Tax}}{\text{Interest on long-term debt}} \\ &= \frac{₹ 2,50,000}{₹ 1,50,000} \end{aligned}$$

$$= 1.67 \text{ times.}$$

$$\begin{aligned}
 \text{(ii) Debt Service Coverage Ratio} &= \frac{\text{Earnings available for debt services}}{\text{Interest + Instalments}} \\
 &= \frac{\text{₹ 2,50,000}}{\text{₹ 1,50,000 + 50,000}} \\
 &= \frac{\text{₹ 2,50,000}}{\text{₹ 2,00,000}} \\
 &= 1.25 \text{ times}
 \end{aligned}$$

Working Notes

$$\begin{aligned}
 1. \text{ Net Profit before tax} &= \text{Net profit after tax} \times 100 / (100 - \text{Tax rate}) \\
 &= \text{₹ 60,000} \times 100 / (100 - 40) \\
 &= \text{₹ 1,00,000} \\
 2. \text{ Interest on Long-term Debt} &= 15\% \text{ of ₹ 10,00,000} = \text{₹ 1,50,000} \\
 3. \text{ Net profit before interest and tax} &= \text{Net profit before tax} + \text{Interest} \\
 &= \text{₹ 1,00,000} + \text{₹ 1,50,000} \\
 &= \text{₹ 2,50,000}
 \end{aligned}$$

(c) Preference Dividend Coverage Ratio: This ratio measures the ability of a firm to pay dividend on preference shares which carry a stated rate of return. This ratio is computed as:

$$\text{Preference Dividend Coverage Ratio} = \frac{\text{Net Profit / Earning after taxes (EAT)}}{\text{Preference dividend liability}}$$

Earnings after tax is considered because unlike debt on which interest is charged on the profit of the firm, the preference dividend is treated as appropriation of profit. Interest on debt is tax deductible whereas preference dividend is paid only after payment of tax.

This ratio indicates margin of safety available to the preference shareholders. A higher ratio is desirable from preference shareholders point of view.

Similarly, **Equity Dividend coverage** ratio can also be calculated taking (EAT – Pref. Dividend) and equity fund figures into consideration.

(d) Fixed Charges Coverage Ratio: This ratio shows how many times the cash flow before interest and taxes covers all fixed financing charges. If this ratio is more than 1, it is considered as safe. It shows how many times a company can pay its fixed cost with its income before interest and taxes.

$$\text{Fixed Charges Coverage Ratio} = \frac{\text{EBIT} + \text{Fixed Charges before tax}}{\text{Interest} + \text{Fixed Charges before tax}}$$

ILLUSTRATION 10

	₹
Earnings before interest and taxes	80,000
Lease payments	50,000
Interest	30,000

You are required to compute fixed charges coverage ratio from the above information.

SOLUTION

$$\begin{aligned} \text{Fixed Charges Coverage Ratio} &= \frac{\text{EBIT} + \text{Fixed Charges before tax}}{\text{Interest} + \text{Fixed Charges before tax}} \\ &= \frac{80,000 + 50,000}{30,000 + 50,000} \\ &= 1.625: 1 \end{aligned}$$

Notes for calculating Ratios:

1. EBIT (Earnings before interest and taxes) = PBIT (Profit before interest and taxes),
EAT (Earnings after taxes) = PAT (Profit after taxes),
EBT (Earnings before taxes) = PBT (Profit before taxes)
2. Ratios shall be calculated based on requirement and availability and may deviate from original formulae.
3. Numerator should be taken in correspondence with the denominator and vice-versa.

7.3 Activity Ratio/ Efficiency Ratio/ Performance Ratio/ Turnover Ratio: These ratios are employed to evaluate the efficiency with which the firm manages and utilizes its assets. For this reason, they are often called 'Asset management ratios'. These ratios usually indicate the frequency of sales with respect to its

assets. These assets may be capital assets or working capital or average inventory.

Activity Ratio/Efficiency Ratio/Performance Ratio/Turnover Ratio:

- (a) Total Assets Turnover Ratio
- (b) Fixed Assets Turnover Ratio
- (c) Capital Turnover Ratio
- (d) Current Assets Turnover Ratio
- (e) Working Capital Turnover Ratio
 - (i) Inventory/Stock Turnover Ratio
 - (ii) Receivables (Debtors) Turnover Ratio
 - (iii) Payables (Creditors) Turnover Ratio.

These ratios are usually calculated with reference to sales/cost of goods sold and are expressed in terms of rate or times.

Asset Turnover Ratios: Based on different concepts of assets employed, it can be expressed as follows:

(a) Total Asset Turnover Ratio: This ratio measures the efficiency with which the firm uses its total assets. This ratio is computed as:

$$\text{Total Asset Turnover Ratio} = \frac{\text{Sales / Cost of Goods Sold}}{\text{Total Assets}}$$

(b) Fixed Assets Turnover Ratio: It measures the efficiency with which the firm uses its fixed assets.

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{Sales / Cost of Goods Sold}}{\text{Fixed Assets}}$$

A high fixed assets turnover ratio indicates efficient utilization of fixed assets in generating sales. A firm whose plant and machinery are old may show a higher fixed assets turnover ratio than the firm which has purchased them recently.

(c) Capital Turnover Ratio/Net Asset Turnover Ratio:

$$\text{Capital Turnover Ratio} = \frac{\text{Sales / Cost of Goods Sold}}{\text{Net Assets}}$$

This ratio indicates the firm's ability of generating sales/ Cost of Goods Sold per rupee of long term investment. The higher the ratio, the more efficient is the utilisation of owner's and long-term creditors' funds. Net Assets includes Net Fixed Assets and Net Current Assets (Current Assets – Current Liabilities). Since Net Assets equals to capital employed it is also known as Capital Turnover Ratio.

(d) Current Assets Turnover Ratio: It measures the efficiency using the current assets by the firm.

$$\text{Current Assets Turnover Ratio} = \frac{\text{Sales / Cost of Goods Sold}}{\text{Current Assets}}$$

(e) Working Capital Turnover Ratio:

$$\text{Working Capital Turnover Ratio} = \frac{\text{Sales / Cost of Goods Sold}}{\text{Working Capital}}$$

Working Capital Turnover is further segregated into inventory Turnover, Debtors Turnover, and Creditors Turnover.

Note: Average of Total Assets/Fixed Assets/Current Assets/Net Assets/Working Capital also can be taken.

 **ILLUSTRATION 11**

Particulars	Amount ₹	Particulars	Amount ₹
Preference share capital	8,00,000	Land and Building	10,00,000
Equity share capital	12,00,000	Plant and Machinery	16,00,000
General reserve	2,00,000	Furniture	2,00,000
Statement of Profit and Loss (bal.)	6,00,000	Motor Car	4,00,000
15% debentures	4,00,000	Inventory	3,60,000
14% Loan	4,00,000	Debtors	2,20,000
Creditors	3,80,000	Cash and Bank	2,20,000
Outstanding expenses	20,000	Sales	60,00,000

You are required to calculate (i) Net assets turnover ratio, (ii) Fixed assets turnover ratio, and (iii) Working capital turnover ratio (iv) Current Assets turnover ratio (v) Total Assets turnover ratio with the help of above information.

 **SOLUTION**

$$\begin{aligned} \text{(i) Net Assets Turnover Ratio} &= \frac{\text{Sales}}{\text{Net Assets}} \\ &= ₹ 60,00,000 / ₹ 36,00,000 \\ &= 1.67 \text{ times} \\ \text{(ii) Fixed Assets Turnover Ratio} &= \frac{\text{Sales}}{\text{Fixed Assets}} \\ &= ₹ 60,00,000 / ₹ 32,00,000 \\ &= 1.88 \text{ times} \\ \text{(iii) Working Capital Turnover Ratio} &= \frac{\text{Sales}}{\text{Working Capital}} \end{aligned}$$

$$= ₹ 60,00,000 / ₹ 4,00,000$$

$$= 15 \text{ times.}$$

$$(iv) \text{ Current Assets Turnover Ratio} = \frac{\text{Sales}}{\text{Current Assets}}$$

$$= ₹ 60,00,000 / ₹ 8,00,000$$

$$= 7.5 \text{ times}$$

$$(v) \text{ Total Assets Turnover Ratio} = \frac{\text{Sales}}{\text{Total Assets}}$$

$$= ₹ 60,00,000 / ₹ 40,00,000$$

$$= 1.5 \text{ times}$$

Working Notes

W.N. 1:

Capital Employed

(or Net Assets)

$$= \text{Share Capital} + \text{Reserves and Surplus} + \text{Long-term Debts}$$

$$= ₹ 8,00,000 + ₹ 12,00,000 + ₹ 2,00,000 + ₹ 6,00,000 + ₹ 4,00,000 + ₹ 4,00,000$$

$$= ₹ 36,00,000$$

W.N. 2:

Fixed Assets

$$= ₹ 16,00,000 + ₹ 10,00,000 + ₹ 4,00,000 + ₹ 2,00,000$$

$$= ₹ 32,00,000$$

W.N. 3:

Working Capital

$$= \text{Current Assets} - \text{Current Liabilities}$$

$$= (3,60,000 + 2,20,000 + 2,20,000) - (3,80,000 + 20,000)$$

$$= ₹ 8,00,000 - ₹ 4,00,000$$

$$= ₹ 4,00,000$$

(i) **Inventory Turnover Ratio:** This ratio also known as stock turnover ratio, it establishes the relationship between the cost of goods sold during the year and average inventory held during the year. It measures the efficiency with which a firm utilizes or manages its inventory. It is calculated as follows:

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of Goods Sold} / \text{Sales}}{\text{Average Inventory}^*}$$

$$\text{*Average Inventory} = \frac{\text{Opening Stock} + \text{Closing Stock}}{2}$$

In the case of inventory of raw material the inventory turnover ratio is calculated using the following formula :

$$\frac{\text{Raw Material Consumed}}{\text{Average Raw Material Stock}}$$

This ratio indicates that how fast inventory is used or sold. A high ratio is good from the view point of liquidity and vice versa. A low ratio would indicate that inventory is not used/ sold/ lost and stays in a shelf or in the warehouse for a long time.

ILLUSTRATION 12

From the following information, calculate inventory turnover ratio :

	₹		₹
Inventory in the beginning	54,000	Inventory at the end	66,000
Net purchases	1,38,000	Carriage inwards	12,000
Wages	42,000		

SOLUTION

$$\begin{aligned} \text{Inventory Turnover Ratio} &= \text{Cost of goods sold} / \text{Average inventory} \\ \text{Inventory Turnover Ratio} &= ₹ 1,80,000 / ₹ 60,000 \\ &= 3 \text{ Times} \end{aligned}$$

Working notes:

- Cost of goods sold = Inventory in the beginning + Net Purchases + Wages + Carriage inwards – Inventory at the end
 $= ₹ 54,000 + ₹ 1,38,000 + ₹ 42,000 + ₹ 12,000 - ₹ 66,000$
 $= ₹ 1,80,000$
- Average inventory = $(\text{Inventory in the beginning} + \text{inventory at the end}) / 2$
 $= (₹ 54,000 + ₹ 66,000) / 2$
 $= ₹ 60,000$

ILLUSTRATION 13

You are required to calculate inventory turnover ratio from the following information:

$$\begin{aligned} &₹ \\ \text{Sales} &= 8,00,000 \end{aligned}$$

Average inventory	= 1,20,000
Gross Profit Ratio	= 10%

**SOLUTION**

Inventory Turnover Ratio	= Cost of goods sold/Average inventory
	= ₹7,20,000/ ₹1,20,000
	= 6 times

Working note

- Gross Profit = 10% of ₹ 8,00,000 = ₹ 80,000
- Cost of goods sold = Sales – Gross Profit
= ₹ 8,00,000 – ₹ 80,000 = ₹ 7,20,000

(ii) Receivables (Debtors) Turnover Ratio: In case firm sells goods on credit, the realization of sales revenue is delayed and the receivables are created. The cash is realised from these receivables later on.

The speed with which these receivables are collected affects the liquidity position of the firm. The debtor's turnover ratio throws light on the collection and credit policies of the firm. It measures the efficiency with which management is managing its accounts receivables. It is calculated as follows:

$$\text{Receivables (Debtor) Turnover Ratio} = \frac{\text{Credit Sales}}{\text{Average Accounts Receivable}}$$

**ILLUSTRATION 14**

Calculate the Trade receivables turnover ratio from the following information:

	₹
Total Sales	4,00,000
Cash Sales	20% of Total Revenue from operations
Trade receivables as at 1.4.2016	40,000
Trade receivables as at 31.3.2017	1,20,000

**SOLUTION**

Trade Receivables Turnover Ratio	= Net Credit Sales/Average Trade receivables
Trade Receivables Turnover Ratio	= ₹ 3,20,000/ ₹ 80,000
	= 4 times

Working notes

- Credit Sales = Total Sales – Cash Sales
Cash Sales = 20% of ₹ 4,00,000
= ₹ 80,000
Credit Sales = ₹ 4,00,000 – ₹ 80,000 = ₹ 3,20,000

$$\begin{aligned}
 2. \text{ Average Trade Receivables} &= (\text{Opening Trade Receivables} + \text{Closing Trade Receivables}) / 2 \\
 &= (\text{₹ } 40,000 + \text{₹ } 1,20,000) / 2 \\
 &= \text{₹ } 80,000
 \end{aligned}$$

Trade Receivables Turnover Ratios = Net Credit Sales/Average Inventory

Receivables (Debtors') Velocity: Debtors' turnover ratio indicates the average collection period. However, the average collection period can be directly calculated as follows:

$$\begin{aligned}
 \text{Receivable Velocity/Average Collection Period} &= \frac{\text{Average Accounts Receivable}}{\text{Average Daily Credit Sales}} \\
 \text{Or,} &= \frac{12 \text{ months / 52 weeks / 360 days}}{\text{Receivable Turnover Ratio}} \\
 \text{Average Daily Credit Sales} &= \frac{\text{Credit Sales}}{\text{No. of days in year (say 360)}}
 \end{aligned}$$



ILLUSTRATION 15

From the data given in illustration no. 14, find out the average collection period.



SOLUTION

$$\begin{aligned}
 \text{Average daily credit sales} &= 3,20,000/360 \\
 &= \text{₹ } 888.89 \\
 \text{Average Collection Period} &= \frac{\text{Average Trade Receivables}}{\text{Average Daily Credit Sales}} \\
 &= \text{₹ } 80,000 / \text{₹ } 888.89 \\
 &= 90 \text{ days}
 \end{aligned}$$

Therefore, on an average debtors take 90 days to pay.

The average collection period measures the average number of days it takes to collect an account receivable. This ratio is also referred to as the number of days of receivable and the number of day's sales in receivables.

(iii) Payables Turnover Ratio: This ratio is calculated on the same lines as receivable turnover ratio is calculated. This ratio shows the velocity of payables payment by the firm. It is calculated as follows:

$$\text{Payables Turnover Ratio} = \frac{\text{Annual Net Credit Purchases}}{\text{Average Accounts Payables}}$$

A low creditor's turnover ratio reflects liberal credit terms granted by supplies. While a high ratio shows that accounts are settled rapidly.

$$\frac{\text{Credit Purchases}}{\text{Average Accounts Payable}}$$

Payable Velocity/ Average payment period can be calculated using:

$$\frac{\text{Credit Purchases}}{\text{Average Daily Credit Purchases}}$$

Or,

$$= \frac{12 \text{ months /52 weeks/ 360 days}}{\text{Payables Turnover Ratio}}$$

In determining the credit policy, debtor's turnover and average collection period provide a unique guideline.

The firm can compare what credit period it receives from the suppliers and what it offers to the customer. Also it can compare the average credit period offered to the customers in the industry to which it belongs.

The above three ratios i.e. Inventory Turnover Ratio/Receivables Turnover Ratio is also relevant to examine liquidity of an organization.



ILLUSTRATION 16

With the help of following figures you are required to calculate the Trade payables turnover ratio and average payment period:

Credit purchases during 2016-17	=	₹ 24,00,000
Creditors on 1.4.2016	=	6,00,000
Bills Payables on 1.4.2016	=	2,00,000
Creditors on 31.3.2017	=	2,60,000
Bills Payables on 31.3.2017	=	1,40,000



SOLUTION

Trade Payables Turnover Ratio = Net Credit Purchases/Average Trade Payables

Average Trade Payables = (Creditors in the beginning + Bills payables in the beginning + Creditors at the end + Bills payables at the end)/ 2

$$= (\text{₹ } 6,00,000 + \text{₹ } 2,00,000 + \text{₹ } 2,60,000 + \text{₹ } 1,40,000)/2$$

$$= \text{₹ } 6,00,000$$

Trade Payables Turnover Ratio = (₹ 24,00,000/ ₹ 6,00,000) = 4 times

Average payment period = 360 days /Turnover ratio

$$= 360 / 4$$

$$= 90 \text{ days}$$

Notes for calculating Ratios:

1. Only selling & distribution expenses differentiate Cost of Goods Sold (COGS) from Cost of Sales (COS). In absence of these expenses COGS will be equal to Cost of sales.
COGS + Selling & Distribution Expenses = COS
2. We can consider Cost of Goods Sold/ Cost of Sales to calculate turnover ratios eliminating profit part.

3. Average of Total Assets/ Fixed Assets/ Current Assets/ Net Assets/ Working Capital/ also can be taken in calculating the above ratios. Infact when average figures of total assets, net assets, capital employed, shareholders' fund etc. are available it may be preferred to calculate ratios by using this information.
4. Ratios shall be calculated based on requirement and availability and may deviate from original formulae.

7.4 PROFITABILITY RATIOS: The profitability ratios measure the profitability or the operational efficiency of the firm. These ratios reflect the final results of business operations. They are some of the most closely watched and widely quoted ratios. Management attempts to maximize these ratios to maximize firm value. The results of the firm can be evaluated in terms of its earnings with reference to a given level of assets or sales or owner's interest etc. Therefore, the profitability ratios are broadly classified in four categories:

- (i) Profitability Ratios related to Sales
- (ii) Profitability Ratios related to overall Return on Investment
- (iii) Profitability Ratios required for Analysis from Owner's Point of View
- (iv) Profitability Ratios related to Market/ Valuation/ Investors

Profitability Ratios are as follows:

1. Profitability Ratios based on Sales

- (a) Gross Profit Ratio
- (b) Net Profit Ratio
- (c) Operating Profit Ratio
- (d) Expenses Ratio

2. Profitability Ratios related to Overall Return on Assets/ Investments

- (a) Return on Investments (ROI)
- (b) Return on Assets (ROA)
- (c) Return of Capital Employed (ROCE)
- (d) Return on Equity (ROE)

3. Profitability Ratios required for Analysis from Owner's Point of View

- (a) Earnings per Share (EPS)
- (b) Dividend per Share (DPS)
- (c) Dividend Payout Ratio (DP)

4. Profitability Ratios related to Market/ Valuation/ Investors

- (a) Price Earnings (P/E) Ratio
- (b) Dividend and Earning Yield
- (c) Market Value/ Book Value per Share (MV/BV)

7.4.1 Profitability Ratios based on Sales

(a) **Gross Profit (G.P) Ratio/Gross Profit Margin:** It measures the percentage of each sale in rupees remaining after payment for the goods sold.

$$\text{Gross Profit Ratio} = \frac{\text{Gross Profit}}{\text{Sales}} \times 100$$

Gross profit margin depends on the relationship between price/ sales, volume and costs. A high Gross Profit Margin is a favourable sign of good management.



ILLUSTRATION 17

Following information is available for the year 2016-17, calculate gross profit ratio:

	₹		₹
Sales : Cash	50,000	Salaries	50,000
: Credit	1,50,000	Decrease in inventory	20,000
Purchases : Cash	30,000	Return Outwards	4,000
: Credit	1,20,000	Wages	10,000
Carriage Inwards	4,000		



SOLUTION

$$\begin{aligned} \text{Gross Profit Ratio} &= \text{Gross Profit/Net Sales} \times 100 \\ &= ₹ 20,000/₹ 2,00,000 \times 100 \\ &= 10\% \end{aligned}$$

Working notes:

- Sales = Sales + Credit Sales
= ₹ 50,000 + ₹ 1,50,000 = ₹ 2,00,000
- Net Purchases = Cash Purchases + Credit Purchases – Return Outwards
= ₹ 30,000 + ₹ 1,20,000 – ₹ 4,000 = ₹ 1,46,000
- Cost of goods sold
= Purchases + (Opening Inventory – Closing Inventory) +
Direct Expenses (Wages + Carriage Inwards)
= ₹ 1,46,000 + ₹ 20,000 + (₹ 4,000 + ₹ 10,000)
= ₹ 1,80,000
- Gross Profit = Sales – Cost of goods sold
= ₹ 2,00,000 – ₹ 1,80,000
= ₹ 20,000

Gross profit can also be calculated by making Trading Account as follows:

Trading A/c			
Particulars	₹	Particulars	₹
To Decrease in Stock	20,000	By Sales	
To Purchases:		Cash	50,000
Cash	30,000	Credit	<u>1,50,000</u>
Credit	1,20,000		2,00,000
Less: Return Outwards	<u>4,000</u>		
	1,46,000		
To Wages	10,000		
To Carriage Inwards	4,000		
To Gross Profit	20,000		
	<u>2,00,000</u>		<u>2,00,000</u>

(b) Net Profit Ratio/Net Profit Margin: It measures the relationship between net profit and sales of the business. Depending on the concept of net profit it can be calculated as:

$$(i) \text{ Net Profit Ratio} = \frac{\text{Net Profit}}{\text{Sales}} \times 100 = \frac{\text{Earnings after taxes (EAT)}}{\text{Sales}} \times 100$$

$$(ii) \text{ Pre-tax Profit Ratio} = \frac{\text{Earnings before taxes (EBIT)}}{\text{Sales}} \times 100$$

Net Profit ratio finds the proportion of revenue that finds its way into profits. A high net profit ratio will ensure positive returns of the business.

ILLUSTRATION 18

Gross profit ratio of X Ltd. was 25%. Its credit sales was ₹ 20,00,000 and its cash sales was 10% of the total revenue from sales.

You are required to calculate its net profit ratio if the indirect expenses of the X Ltd. were ₹ 50,000,

SOLUTION

Cash Sales	= ₹ 20,00,000 × 10/90
	= ₹ 2,22,222
Hence, total sales are	= ₹ 22,22,222
Gross profit	= 0.25 × 22,22,222 = ₹ 5,55,555
Net profit	= ₹ 5,55,555 – 50,000
	= ₹ 5,05,555
Net profit ratio	= Net profit/Sales × 100
	= ₹ 5,05,555/₹ 22,22,222 × 100
	= 22.75%.

(c) Operating Profit Ratio:

Operating profit ratio is calculated to evaluate operating performance of business.

$$\text{Operating Profit Ratio} = \frac{\text{Operating Profit}}{\text{Sales}} \times 100 \quad \text{or,} \quad \frac{\text{Earnings before interest and taxes (EBIT)}}{\text{Sales}} \times 100$$

Where,

$$\text{Operating Profit} = \text{Sales} - \text{Cost of Goods sold (COGS)} - \text{Expenses}$$

Operating profit ratio measures the percentage of each sale in rupees that remains after the payment of all costs and expenses except for interest and taxes. This ratio is followed closely by analysts because it focuses on operating results. Operating profit is often referred to as earnings before interest and taxes or EBIT.

**ILLUSTRATION 19**

You are required to calculate (i) Gross profit ratio and (ii) Operating profit ratio with the help of following information:

	₹
Sales	6,80,000
Cost of goods sold	2,40,000
Selling Expenses	1,60,000
Administrative Expenses	80,000

**SOLUTION**

- (i) Gross Profit Ratio = Gross Profit/Sales × 100
 = ₹ 4,40,000/ ₹ 6,80,000 × 100
 = 64.71%
- (ii) Operating Profit Ratio = Operating Profit/Sales × 100
 = (6,80,000 – 4,80,000)/6,80,000 × 100
 = 29.41%

Working Notes:

- Gross Profit = Sales – Cost of goods sold
 = ₹ 6,80,000 – ₹ 2,40,000
 = ₹ 4,40,000
- Operating Cost = Cost of goods sold + Selling Expenses + Administrative Expenses
 = ₹ 2,40,000 + 1,60,000 + 80,000
 = ₹ 4,80,000

(d) Expenses Ratio: Based on different concepts of expenses it can be expressed in different variants as below:

$$(i) \text{ Cost of Goods Sold (COGS) Ratio} = \frac{\text{COGS}}{\text{Sales}} \times 100$$

$$(ii) \text{ Operating Ratio} = \frac{\text{COGS} + \text{Operating expenses}}{\text{Sales}} \times 100$$

$$(iii) \text{ Financial Expenses Ratio} = \frac{\text{Financial expenses}^*}{\text{Sales}} \times 100$$

*It excludes taxes, loss due to theft, goods destroyed by fire etc.

Administration Expenses Ratio, Selling & Distribution Expenses Ratio also can be calculated in similar ways.

7.4.2 Profitability Ratios related to Overall Return on Investments

(a) Return on Investment (ROI): ROI is the most important ratio of all. It is the percentage of return on funds invested in the business by its owner. In short, this ratio tells the owner whether or not all the effort put into the business has been worthwhile. It compares earnings/returns/profit with the investment in the company. The ROI is calculated as follows:

$$\text{Return on Investment} = \frac{\text{Return/Profit/Earnings}}{\text{Investment}} \times 100$$

Or,

$$= \frac{\text{Return/Profit/Earnings}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Investment}}$$

$$(i) \frac{\text{Return/Profit/Earnings}}{\text{Sales}} = \text{Profitability Ratio}$$

$$(ii) \text{ Investment Turnover Ratio} = \frac{\text{Sales}}{\text{Investments}}$$

So, ROI = Profitability Ratio × Investment Turnover Ratio.

ROI can be improved either by improving Profitability Ratio or Investment Turnover Ratio or by both.

The concept of investment varies and accordingly there are three broad categories of ROI i.e.

- (i) Return on Assets (ROA),
- (ii) Return on Capital Employed (ROCE) and
- (iii) Return on Equity (ROE).

We should keep in mind that investment may be Total Assets or Net Assets. Further funds employed in net assets are also known as capital employed which is nothing but Net worth plus Debt. Where Net worth is equity shareholders' fund. Similarly the concept of returns/ earnings/ profits may vary as per the requirement and availability of information.

(b) Return on Assets (ROA): The profitability ratio is measured in terms of relationship between net profits and assets employed to earn that profit. This ratio measures the profitability of the firm in terms of assets employed in the firm. Based on various concepts of net profit (return) and assets the ROA may be measured as follows:

$$\text{ROA} = \frac{\text{Net Profit after taxes}}{\text{Average Total Assets}} \text{ or } \frac{\text{Net Profit after taxes}}{\text{Average Tangible Assets}} \text{ or } \frac{\text{Net Profit after taxes}}{\text{Average Fixed Assets}}$$

Here net profit is exclusive of interest. As Assets are also financed by lenders, hence ROA can be calculated as:

$$= \frac{\text{Net Profit after taxes} + \text{Interest}}{\text{Average Total Assets} / \text{Average Tangible Assets} / \text{Average Fixed Assets}}$$

$$\text{Or, } \frac{\text{EBIT}(1-t)}{\text{Average Total Assets}} \text{ \{also known as \textbf{Return on Total Assets} (ROTA)\}}$$

$$\text{Or, } \frac{\text{EBIT}(1-t)}{\text{Average Net Assets}} \text{ \{also known as \textbf{Return on Net Assets} (RONA)\}}$$

(c) Return on Capital Employed (ROCE): It is another variation of ROI.

The ROCE is calculated as follows:

$$\text{ROCE (Pre-tax)} = \frac{\text{Earnings before interest and taxes (EBIT)}}{\text{Capital Employed}} \times 100$$

$$\text{ROCE (Post-tax)} = \frac{\text{EBIT}(1-t)}{\text{Capital Employed}} \times 100$$

Sometime it is calculated as

$$= \frac{\text{Net Profit after taxes (PAT/EAT)} + \text{Interest}}{\text{Capital Employed}} \times 100$$

Where,

$$\text{Capital Employed} = \text{Total Assets} - \text{Current Liabilities}$$

OR

$$= \text{Fixed Assets} + \text{Working Capital}$$

ROCE should always be higher than the rate at which the company borrows.

Intangible assets (assets which have no physical existence like goodwill, patents and trademarks) should be included in the capital employed. But no fictitious asset should be included within capital employed. If information is available in the question, then average capital employed shall be taken.

(d) Return on Equity (ROE): Return on Equity measures the profitability of equity funds invested in the firm. This ratio reveals how profitably of the owners' funds have been utilised by the firm. It also measures the percentage return generated to equity shareholders. This ratio is computed as:

$$\text{ROE} = \frac{\text{Net Profit after taxes} - \text{Preference dividend (if any)}}{\text{Net worth / equity shareholders' fund}} \times 100$$

Return on equity is one of the most important indicators of a firm's profitability and potential growth. Companies that boast a high return on equity with little or no debt are able to grow without large capital expenditures, allowing the owners of the business to withdraw cash and reinvest it elsewhere.

Many investors fail to realize, however, that two companies can have the same return on equity, yet one can be a much better business. If return on total shareholders is calculated then Net Profit after taxes (before preference dividend) shall be divided by total shareholders' fund includes preference share capital. ROE can also be considered under profitability ratio required for analysis from owner's point of view.

ILLUSTRATION 20

	₹
EBIT	10,00,000
Interest	2,50,000
Taxes paid	1,50,000
Preference dividend	60,000
Current assets	5,00,000
Fixed assets	12,00,000
Current liabilities	50,000

You are required to calculate (i) Return on Assets and (ii) Return on Capital Employed.

SOLUTION

$$\begin{aligned} \text{Return on Assets} &= \frac{\text{EBIT}(1-t)}{\text{Average Total Assets}} \\ &= \frac{\text{₹ } 10,00,000 (1 - 0.20)}{\text{₹ } 17,00,000} \times 100 \\ &= 47.06\% \end{aligned}$$

$$\begin{aligned} \text{ROCE (Post-tax)} &= \frac{\text{EBIT}(1-t)}{\text{Capital Employed}} \times 100 \\ &= \text{₹ } 8,00,000 \times 100 / \text{₹ } 16,50,000 \\ &= 48.48\% \end{aligned}$$

Working Notes:

$$\begin{aligned} 1. \quad \text{Total Assets} &= \text{Current Assets} + \text{Fixed Assets} \\ &= \text{₹ } 5,00,000 + \text{₹ } 12,00,000 \\ &= \text{₹ } 17,00,000 \end{aligned}$$

2. Capital Employed = Total Assets – Current Liabilities

$$= ₹ 17,00,000 - ₹ 50,000$$

$$= ₹ 16,50,000.$$

3. Computation of tax rate:

$$\text{EBT} = \text{EBIT} - \text{Interest}$$

$$= ₹ 10,00,000 - ₹ 2,50,000$$

$$= ₹ 7,50,000$$

$$\text{So, Tax Rate} = \frac{\text{Tax Paid}}{\text{EBT}} \times 100$$

$$= ₹ 1,50,000 / 7,50,000 \times 100$$

$$t = 20\%$$



ILLUSTRATION 21

Following information is given to you:-

	₹
Fixed Assets	5,00,000
Current Assets	2,00,000
Current Liabilities	1,00,000
EBIT	10,00,000
Tax rate	30%
Interest Expense	30,000
10% Preference Share Capital	6,00,000
Equity Shareholder's Funds	10,00,000

Total Assets in the beginning were ₹ 8,00,000.

- (a) Calculate Return on Assets
- (b) Calculate Return on Capital Employed
- (c) Calculate Return on Equity



SOLUTION

$$(a) \text{ Return on Assets} = \frac{\text{Net Profit (After Tax)}}{\text{Average Total Assets}} \times 100$$

$$\begin{aligned}
 \text{Return on Assets} &= \frac{6,79,000}{7,50,000} \times 100 \\
 &= 90.53\% \\
 \text{(b) Return on Capital Employed} &= \frac{\text{EBIT}}{\text{Capital Employed}} \times 100 \\
 &= \frac{10,00,000}{6,00,000} \times 100 \\
 &= 166.67\% \\
 \text{(c) Return on Equity} &= \frac{\text{Net Profit (EAT) - Preference Dividend}}{\text{Shareholder's Funds}} \times 100 \\
 &= \frac{6,79,000 - 60,000}{10,00,000} \times 100 \\
 &= 61.9\% \text{ or } 62\% \text{ (approx.)}
 \end{aligned}$$

Working Notes:

		₹
1.	EBIT	10,00,000
	Less: Interest	(30,000)
	EBT	9,70,000
	Less: Tax (30%)	2,91,000
	EAT	6,79,000

$$\begin{aligned}
 \text{2. Average Total Assets} &= \frac{\text{Opening Assets} + \text{Closing Assets}}{2} \\
 &= \frac{₹ 8,00,000 + ₹ 7,00,000}{2} \\
 &= ₹ 7,50,000 \\
 \text{3. Capital employed} &= \text{Total assets} - \text{Current Liabilities} \\
 &= 7,00,000 - 1,00,000 \\
 &= ₹ 6,00,000
 \end{aligned}$$

7.4.3 Profitability Ratios Required for Analysis from Owner's Point of View

(a) **Earnings per Share (EPS):** The profitability of a firm from the point of view of ordinary shareholders can be measured in terms of number of equity shares. This is known as Earnings per share. It is calculated as follows:

$$\text{Earnings per Share (EPS)} = \frac{\text{Net profit available to equity share holders}}{\text{number of equity shares outstanding}}$$

(b) **Dividend per Share (DPS):** Earnings per share as stated above reflects the profitability of a firm per share; it does not reflect how much profit is paid as dividend and how much is retained by the business. Dividend per share ratio indicates the amount of profit distributed to equity shareholders per share. It is calculated as:

$$\text{Dividend per Share (DPS)} = \frac{\text{Total Dividend Paid to equity shareholders}}{\text{number of equity shares outstanding}}$$

(c) **Dividend Payout Ratio (DP):** This ratio measures the dividend paid in relation to net earnings. It is determined to see to how much extent earnings per share have been retained by the management for the business. It is computed as:

$$\text{Dividend payout Ratio} = \frac{\text{Dividend per equity share (DPS)}}{\text{Earning per Share (EPS)}}$$

7.4.4 Profitability Ratios related to market/ valuation/ Investors: These ratios involve measures that consider the market value of the company's shares. Frequently share prices data are punched with the accounting data to generate new set of information. These are (a) Price- Earnings Ratio, (b) Dividend Yield, (c) Market Value/Book Value per share.

(a) **Price- Earnings Ratio (P/E Ratio):** The price earnings ratio indicates the expectation of equity investors about the earnings of the firm. It relates earnings to market price and is generally taken as a summary measure of growth potential of an investment, risk characteristics, shareholders orientation, corporate image and degree of liquidity. It is calculated as

$$\text{Price-Earnings per Share (P/E Ratio)} = \frac{\text{Market Price per Share (MPS)}}{\text{Earning per Share (EPS)}}$$

It indicates the payback period to the investors or prospective investors

(b) **Dividend and Earning Yield:**

$$\text{Dividend Yield} = \frac{\text{Dividend} \pm \text{Change in share price}}{\text{Initial share price}} \times 100$$

Sometime it is calculated as:

$$\frac{\text{Dividend per Share (DPS)}}{\text{Market Price per Share (MPS)}} \times 100$$

This ratio indicates return on investment; this may be on average investment or closing investment. Dividend (%) indicates return on paid up value of shares. But yield (%) is the indicator of true return in which share capital is taken at its market value. Earning Yield also can be calculated as:

$$\text{Earnings Yield} = \frac{\text{Earnings per Share (EPS)}}{\text{Market Price per Share (MPS)}} \times 100$$

Also known as Earnings Price (EP) Ratio.

- (c) **Market Value/Book Value per Share (MV/BV):** It provides evaluation of how investors view the company's past and future performance.

$$\frac{\text{Market value per share}}{\text{Book value per share}} = \frac{\text{Average share price}}{\text{Net worth} \div \text{No. of equity shares}}$$

Or,
$$\frac{\text{Closing share price}}{\text{Net worth} \div \text{No. of equity shares}}$$

This ratio indicates market response of the shareholders' investment. Undoubtedly, higher the ratios better is the shareholders' position in terms of return and capital gains.

 **ILLUSTRATION 22**

	₹
Operating Profit (EBIT)	30,00,000
Tax Rate	40%
Equity Share Capital (FV = ₹ 10)	50,00,000
12% Preference Share Capital	25,00,000
15% Debentures	10,00,000
PE Ratio	15
Retained Earnings Ratio	60%

Find Out:

- (a) Earnings per share
- (b) Market Price/Share
- (c) Dividend Per Share
- (d) Dividend Payout Ratio
- (e) Earnings Yield

**SOLUTION**

	₹
EBIT	30,00,000
Less: Interest (Deb.)	<u>(1,50,000)</u>
EBT	28,50,000
Less: Tax (40%)	<u>(11,40,000)</u>
EAT	17,10,000
Less: Pref. Dividend	<u>(3,00,000)</u>
Earnings for Equity Shareholders	14,10,000
Retained Earnings (60%)	<u>(8,46,000)</u>
Dividend Paid	<u>5,64,000</u>

(a) EPS = $\frac{\text{Earnings Available to equity shareholders'}}{\text{No. of Equity Shares}}$

$$= \frac{14,10,000}{5,00,000}$$

$$= ₹ 2.82$$

(b) Market Price = PE Ratio × EPS

$$= 15 \times 2.82$$

$$= ₹ 42.3$$

(c) Dividend Per Share = $\frac{\text{Dividend paid}}{\text{No. of Equity Shares}}$

$$= \frac{5,64,000}{5,00,000}$$

$$= 1.128$$

(d) Dividend Payout Ratio = $\frac{\text{Dividend per Share}}{\text{Earnings per Share}} \times 100$

$$= \frac{1.128}{2.82} \times 100$$

$$= 40\%$$

$$\begin{aligned}
 \text{(e) Dividend Yield} &= \frac{\text{Dividend per Share}}{\text{Market Price per Share}} \times 100 \\
 &= \frac{1.128}{42.3} \times 100 \\
 &= 2.67\% \\
 \text{(f) Earnings Yield} &= \frac{\text{Earnings Per Share}}{\text{Market Price per Share}} \times 100 \\
 &= \frac{2.82}{42.3} \times 100 \\
 &= 6.67\%
 \end{aligned}$$

Notes for calculating Ratios:

1. EBIT (Earnings before interest and taxes) = PBIT (Profit before interest and taxes),
EAT (Earnings after taxes) = PAT (Profit after taxes),
EBT (Earnings before taxes) = PBT (Profit before taxes)
2. In absence of preference dividend PAT can be taken as earnings available to equity shareholders.
3. If information is available then average capital employed shall be taken while calculating ROCE.
3. Ratios shall be calculated based on requirement and availability and may deviate from original formulae.
4. Numerator should be taken in correspondence with the denominator and vice-versa.


SUMMARY

Ratio	Formulae	Comments
Liquidity Ratio		
Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	A simple measure that estimates whether the business can pay short term debts. Ideal ratio is 2 : 1.
Quick Ratio	$\frac{\text{Quick Assets}}{\text{Current Liabilities}}$	It measures the ability to meet current debt immediately. Ideal ratio is 1 : 1.
Cash Ratio	$\frac{\left(\text{Cash and Bank balances} + \text{Marketable Securities} \right)}{\text{Current Liabilities}}$	It measures absolute liquidity of the business.
Net Working Capital Ratio	Current Assets – Current Liabilities	It is a measure of cash flow to determine the ability of business to survive financial crisis.

Capital Structure Ratio

Equity Ratio	$\frac{\text{Shareholders' Equity}}{\text{Capital Employed}}$	It indicates owner's fund in companies to total fund invested.
Debt to equity Ratio	$\frac{\text{Long-term debt}}{\text{Shareholder' Equity}}$	It indicates the composition of capital structure in terms of debt and equity.
Debt to Total assets Ratio	$\frac{\text{Long Term/Total Outside Liabilities}}{\text{Total Assets}}$	It measures how much of total assets is financed by the debt.
Capital Gearing Ratio	$\frac{\left(\begin{array}{l} \text{Preference Share Capital + Debentures} \\ + \text{Other Borrowed funds} \end{array} \right)}{\left(\begin{array}{l} \text{Equity Share Capital +} \\ \text{Reserves \& Surplus - Losses} \end{array} \right)}$	It shows the proportion of fixed interest-bearing capital to equity shareholders' fund. It also signifies the advantage of financial leverage to the equity shareholder.
Proprietary Ratio	$\frac{\text{Proprietary Fund}}{\text{Total Assets}}$	It measures the proportion of total assets financed by shareholders

Coverage Ratios

Debt Service Coverage Ratio (DSCR)	$\frac{\text{Earnings available for debt services}}{\text{Interest + Instalments}}$	It measures the ability to meet the commitment of various debt services like interest, instalment etc. Ideal ratio is 2.
Interest Coverage Ratio	$\frac{\text{EBIT}}{\text{Interest}}$	It measures the ability of the business to meet interest. Ideal ratio is > 1.
Preference Dividend Coverage Ratio	$\frac{\text{Net Profit / Earning after taxes (EAT)}}{\text{Preference dividend liability}}$	It measures the ability to pay the preference shareholders' dividend. Ideal ratio is > 1.
Fixed Charges Coverage Ratio	$\frac{\text{EBIT + Fixed charge after tax}}{\text{Interest + Fixed charge after tax}}$	This ratio shows how many times the cash flow before interest and taxes covers all fixed financing charges. The ideal ratio is > 1.

Activity Ratio/ Efficiency Ratio/ Performance Ratio/ Turnover Ratio

Total Asset Turnover Ratio	$\frac{\text{Sales / Cost of Goods Sold}}{\text{Average Total Assets}}$	A measure of total asset utilisation. It helps to answer the question - What sales are being generated by each rupee's worth of assets invested in the business?
Fixed Assets Turnover Ratio	$\frac{\text{Sales/Cost of goods sold}}{\text{Working Capital}}$	This ratio is about fixed asset capacity. A reducing sales or profit being generated from each rupee invested in fixed assets may indicate overcapacity or poorer-performing equipment.
Capital Turnover Ratio	$\frac{\text{Sales / Cost of Goods Sold}}{\text{Net Assets}}$	This indicates the firm's ability to generate sales per rupee of long term investment.

Working Capital Turnover Ratio	$\frac{\text{Sales / COGS}}{\text{Working Capital}}$	It measures the efficiency of the firm to use working capital.
Inventory Turnover Ratio	$\frac{\text{COGS / Sales}}{\text{Average Inventory}}$	It measures the efficiency of the firm to manage its inventory.
Debtors Turnover Ratio	$\frac{\text{Credit Sales}}{\text{Average Accounts Receivable}}$	It measures the efficiency at which firm is managing its receivables.
Receivables (Debtors') Velocity	$\frac{\text{Average Accounts Receivables}}{\text{Average Daily Credit Sales}}$	It measures the velocity of collection of receivables.
Payables Turnover Ratio	$\frac{\text{Annual Net Credit Purchases}}{\text{Average Accounts Payables}}$	It measures the efficiency of payables payment.
Payables (Creditors) Velocity	$\frac{\text{Credit Purchases}}{\text{Average Daily Credit Purchases}}$	Measures the velocity of payable payment.

Profitability Ratios based on Sales

Gross Profit Ratio	$\frac{\text{Gross Profit}}{\text{Sales}} \times 100$	This ratio tells us something about the business's ability consistently to control its production costs or to manage the margins it makes on products it buys and sells.
Net Profit Ratio	$\frac{\text{Net Profit}}{\text{Sales}} \times 100$	It measures the relationship between net profit and sales of the business.
Operating Profit Ratio	$\frac{\text{Operating Profit}}{\text{Sales}} \times 100$	It measures operating performance of business.

Expenses Ratio

Cost of Goods Sold (COGS) Ratio	$\frac{\text{COGS}}{\text{Sales}} \times 100$	It measures portion of a particular expenses in comparison to sales.
Operating Ratio	$\frac{\text{COGS + Operating expenses}}{\text{Sales}} \times 100$	It measures portion of a particular expenses in comparison to sales.
Financial Expenses Ratio	$\frac{\text{Financial expenses}}{\text{Sales}} \times 100$	

Profitability Ratios related to Overall Return on Assets/ Investments

Return on Investment (ROI)	$\frac{\text{Return / Profit / Earnings}}{\text{Investments}} \times 100$	It measures overall return of the business on investment/equity funds/capital employed/ assets.
Return on Assets (ROA)	$\frac{\text{Net Profit after taxes}}{\text{Average total assets}}$	It measures net profit per rupee of average total assets/ average tangible assets/ average fixed assets.

Return on Capital Employed ROCE (Pre-tax)	$\frac{\text{EBIT}}{\text{Capital Employed}} \times 100$	It measures overall earnings (either pre-tax or post tax) on total capital employed.
Return on Capital Employed ROCE (Post-tax)	$\frac{\text{EBIT}(1-t)}{\text{Capital Employed}} \times 100$	It indicates earnings available to equity shareholders in comparison to equity shareholders' net worth.
Return on Equity (ROE)	$\frac{\left(\text{Net Profit after taxes} - \text{Preference dividend (if any)} \right)}{\text{Net worth / equity shareholders' fund}} \times 100$	

Profitability Ratios Required for Analysis from Owner's Point of View

Earnings per Share (EPS)	$\frac{\text{Net profit available to equity share holders}}{\text{Number of equity shares outstanding}}$	EPS measures the overall profit generated for each share in existence over a particular period.
Dividend per Share (DPS)	$\frac{\text{Dividend paid to equity share holders}}{\text{Number of equity shares outstanding}}$	Proportion of profit distributed per equity share.
Dividend payout Ratio (DP)	$\frac{\text{Dividend per equity share}}{\text{Earning per Share (EPS)}}$	It shows % of EPS paid as dividend and retained earnings.

Profitability Ratios related to market/ valuation/ Investors

Price-Earnings per Share (P/E Ratio)	$\frac{\text{Market Price per Share (MPS)}}{\text{Earning per Share (EPS)}}$	At any time, the P/E ratio is an indication of how highly the market "rates" or "values" a business. A P/E ratio is best viewed in the context of a sector or market average to get a feel for relative value and stock market pricing.
Dividend Yield	$\frac{\text{Dividend} \pm \text{Change in share Price}}{\text{Initial share price}} \times 100$ OR $\frac{\text{Dividend per Share (DPS)}}{\text{Market Price per Share (MPS)}} \times 100$	It measures dividend paid based on market price of shares.
Earnings Yield	$\frac{\text{Earnings per Share (EPS)}}{\text{Market Price per Share (MPS)}} \times 100$	It is the relationship of earning per share and market value of shares.
Market Value / Book Value per Share	$\frac{\text{Market value per share}}{\text{Book value per share}}$	It indicates market response of the shareholders' investment.

 **TEST YOUR KNOWLEDGE****Multiple Choice Questions**

1. Lenders are interested in _____ to judge the firm's ability to pay off current interest and instalments
 - a. Debt Ratio
 - b. Debt Service Coverage Ratio
 - c. Debt-Equity Ratio
 - d. None of the above
2. The ratio, which indicates the proportion of owner's fund to total fund invested in the business
 - a. Debt Ratio
 - b. Debt Service Coverage Ratio
 - c. Debt-Equity Ratio
 - d. Equity Ratio
3. Activity Ratios are also called as –
 - a. Coverage Ratios
 - b. Leverage Ratios
 - c. Liquidity Ratios
 - d. Turnover Ratios
4. _____ ratio indicates the firm's ability of generating sales per rupee of long term investment
 - a. Capital Turnover Ratio
 - b. Fixed Assets Turnover Ratio
 - c. Inventory Turnover Ratio
 - d. Interest Coverage Ratio
5. The relationship between Sales & Fixed Assets is expressed as _____
 - a. Working Capital Turnover Ratio
 - b. Inventory Turnover Ratio
 - c. Fixed Assets Turnover Ratio
 - d. Capital Turnover Ratio
6. Quick ratio is also known as –
 - a. Absolute liquidity ratio
 - b. Acid Test Ratio
 - c. Cash Ratio
 - d. None of the above
7. Cash Ratio is also known as –
 - a. Acid Test Ratio
 - b. Coverage Ratio
 - c. Absolute Liquidity Ratio
 - d. None of the above
8. _____ ratio is also known as Stock Turnover Ratio
 - a. Working Capital Turnover Ratio
 - b. Inventory Turnover Ratio
 - c. Fixed Assets Turnover Ratio
 - d. Capital Turnover Ratio
9. Working Capital =
 - a. Current Assets – Quick Liabilities
 - b. Quick Assets – Quick Liabilities
 - c. Current Assets – Current Liabilities
 - d. Quick Assets – Current Liabilities
10. Which ratio is the best known measure of financial strength –
 - a. Acid Test Ratio
 - b. Cash Ratio
 - c. Current Ratio
 - d. None of the above

Theory Questions

1. Explain the advantages of Ratio Analysis.
2. What is quick ratio? What does it signify?
3. What do you mean by Stock Turnover ratio?

Practical Questions

1. From the following information, prepare a summarised Balance Sheet as at 31st March, 2017:

Working Capital	₹ 2,40,000
Bank overdraft	₹ 40,000
Fixed Assets to Proprietary ratio	0.75
Reserves and Surplus	₹ 1,60,000
Current ratio	2.5
Liquid ratio	1.5

2. With the help of the following information complete the Balance Sheet of MNOP Ltd.:

Equity share capital	₹ 1,00,000
The relevant ratios of the company are as follows:	
Current debt to total debt	0.40
Total debt to owner's equity	0.60
Fixed assets to owner's equity	0.60
Total assets turnover	2 Times
Inventory turnover	8 Times

3. From the following information calculate "Interest Coverage Ratio" and "Debt Service Coverage Ratio".

	₹
Net Profit before Interest and Taxes	4,00,000
Income Tax Rate	35%
12% Bank Loan	₹ 10,00,000
Annual Instalment for the Repayment of the Bank Loan given above	₹ 2,00,000

4. The following information is furnished to you :-

No. of Shares	4,50,000
Face Value / Share	10
Dividend Distributed	3,60,000
Market Price/Share	22
EPS	2.67

You are required to :-

- (i) Calculate Dividend per share
- (ii) Calculate Dividend Yield

(iii) Calculate Dividend Payout Ratio.

5. The following information of Beta Company as on December 31st 2017 is given as below:

ASSETS

	₹
Current Assets	1,00,000
Fixed Assets	1,50,000
Total	<u>2,50,000</u>

LIABILITIES AND EQUITY

	₹
Current Liabilities	1,00,000
Long Term Liabilities	<u>75,000</u>
Total Liabilities	1,75,000
Shareholder's Funds	<u>75,000</u>
Total	<u>2,50,000</u>
Net Sales	3,75,000
Interest Expense	4,000
Net Profit	22,500

On December 31st 2016, Total Assets were Rs. 2,00,000 and the tax rate is 35%.

Calculate the following ratios of Beta Company as on December 31st 2017.

- (i) Long Term Debt to Total Assets Ratio
- (ii) Net Profit Ratio
- (iii) Return on Total Assets
- (iv) Return on Equity
- (v) Net Sales to Average Total Assets.

ANSWERS/HINTS

MCQs

1.	(b)	2.	(d)	3.	(d)	4.	(a)	5.	(c)	6	(b)
7.	(c)	8.	(b)	9	(c)	10	(c)				

Theoretical Questions

1. Refer para 4 of the chapter.
2. **Quick Ratio:** It is a much more exacting measure than the current ratio. It adjusts the current ratio to eliminate all assets that are not already in cash (or near cash form). A ratio less than one indicate low liquidity and hence is a danger sign.

$$\text{Quick Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

Where,

$$\text{Quick Assets} = \text{Current Assets} - \text{Inventory}$$

3. **Stock Turnover Ratio:** Stock Turnover Ratio helps to find out if there is too much inventory build-up. An increasing stock turnover figure or one which is much larger than the "average" for an industry may indicate poor stock management. The formula for the Stock Turnover Ratio is as follows:

$$\text{Stock Turnover ratio} = \frac{\text{Cost of Sales}}{\text{Average inventory}} \text{ or } \frac{\text{Turnover}}{\text{Average inventory}}$$

Practical Questions

Answer 1

Construction of Balance sheet (Refer to working notes (i) to (iii))

Balance Sheet			
Capital and Liabilities	₹	Assets	₹
Capital	8,00,000	Fixed assets	7,20,000
Reserves & Surplus	1,60,000	Stock	1,60,000
Bank overdraft	40,000	Current assets	2,40,000
Sundry creditors	1,20,000		
	11,20,000		11,20,000

Working notes:

(i) **Current assets and Current liabilities computation:**

$$\frac{\text{Current assets}}{\text{Current liabilities}} = \frac{2.5}{1} \text{ or } \frac{\text{Current assets}}{2.5} = \frac{\text{Current liabilities}}{1} = k \text{ (say)}$$

$$\text{Or Current assets} = 2.5 k \text{ and Current liabilities} = k$$

$$\text{Or Working capital} = (\text{Current assets} - \text{Current liabilities})$$

$$\text{Or ₹ 2,40,000} = k(2.5 - 1) = 1.5 k$$

$$\text{Or } k = ₹ 1,60,000$$

$$\therefore \text{Current liabilities} = ₹ 1,60,000$$

$$\text{Current assets} = ₹ 1,60,000 \times 2.5 = ₹ 4,00,000$$

(ii) Computation of stock

$$\begin{aligned} \text{Liquid ratio} &= \frac{\text{Liquid assets}}{\text{Current liabilities}} \\ \text{Or } 1.5 &= \frac{\text{Current assets} - \text{Stock}}{\text{Rs.1,60,000}} \\ \text{Or } 1.5 \times \text{Rs } 1,60,000 &= \text{Rs } 4,00,000 - \text{Stock} \\ \text{Or } \text{Stock} &= \text{Rs } 1,60,000 \end{aligned}$$

(iii) Computation of Proprietary fund; Fixed assets; Capital and Sundry creditors

$$\begin{aligned} \text{Proprietary ratio} &= \frac{\text{Fixed assets}}{\text{Proprietary fund}} = 0.75 \\ \therefore \text{Fixed assets} &= 0.75 \text{ Proprietary fund} \\ \text{and Net working capital} &= 0.25 \text{ Proprietary fund} \\ \text{Or } \text{Rs } 2,40,000/0.25 &= \text{Proprietary fund} \\ \text{Or } \text{Proprietary fund} &= \text{Rs } 9,60,000 \\ \text{and Fixed assets} &= 0.75 \text{ proprietary fund} \\ &= 0.75 \times \text{Rs } 9,60,000 \\ &= \text{Rs } 7,20,000 \\ \text{Capital} &= \text{Proprietary fund} - \text{Reserves \& Surplus} \\ &= \text{Rs } 9,60,000 - \text{Rs } 1,60,000 = \text{Rs } 8,00,000 \\ \text{Sundry creditors} &= (\text{Current liabilities} - \text{Bank overdraft}) \\ &= (\text{Rs } 1,60,000 - \text{Rs } 40,000) = \text{Rs } 1,20,000 \end{aligned}$$

Answer 2**MNOP Ltd Balance Sheet**

Liabilities	₹	Assets	₹
Owner equity	1,00,000	Fixed assets	60,000
Current debt	24,000	Cash	60,000
Long term debt	36,000	Inventory	40,000
	1,60,000		1,60,000

Working Notes

- i. Total debt = 0.60 x Owners equity = 0.60 x ₹ 1,00,000 = ₹ 60,000
Current debt to total debt = 0.40, hence current debt = 0.40 x 60,000 = 24,000
- ii. Fixed assets = 0.60 x Owners equity = 0.60 x ₹ 1,00,000 = ₹ 60,000
- iii. Total capital employed = Total debt + Owners equity = ₹ 60,000 + ₹ 1,00,000 = ₹ 1,60,000
- iv. Total assets consisting of fixed assets and current assets must be equal to ₹ 1,60,000 (Assets = Liabilities + Owners equity). Since Fixed assets are ₹ 60,000, hence, current assets should be ₹ 1,00,000

$$\begin{aligned} \text{v. } \frac{\text{Total assets to turnover}}{\text{Inventory turnover}} &= \frac{2 \text{ Times}}{8 \text{ Times}} \end{aligned}$$

Hence, Inventory / Total assets = $2/8 = 1/4$, Total assets = ₹ 1,60,000

Therefore Inventory = ₹ 1,60,000/4 = ₹ 40,000 Balance on Asset side = ₹ 1,20,000:

$$\text{vi. Cash} = ₹ 1,60,000 - ₹ 60,000 - ₹ 40,000 = ₹ 60,000$$

Answer 3

$$\text{Annual Interest Charges} = ₹ 10,00,000 \times 12/100 = ₹ 1,20,000$$

$$\begin{aligned} \text{Interest Coverage Ratio} &= \text{Net Profit before interest and taxes} / \text{Interest Charges on Loans} \\ &= ₹ 4,00,000 / ₹ 1,20,000 = 3.33 \text{ times} \end{aligned}$$

$$\begin{aligned} \text{Debt Service Coverage Ratio} &= (\text{Net profit before interest and taxes}) / (\text{Interest Charges} + \text{Principal Amount Repayment}) \\ &= 4,00,000 / 2,00,000 = 2 \text{ times} \end{aligned}$$

Instalments consist of both principal and interest amount.

Answer 4

$$\begin{aligned} \text{(i) Dividend Per Share} &= \frac{\text{Dividend}}{\text{No. of Shares}} \\ &= \frac{3,60,000}{4,50,000} \\ &= 0.8 \text{ ₹ / Share} \end{aligned}$$

$$\begin{aligned} \text{(ii) Dividend Yield} &= \frac{\text{Dividend / Share}}{\text{Market Price / Share}} \times 100 \\ &= \frac{0.80}{22} \times 100 \end{aligned}$$

$$\begin{aligned} &= 3.63\% \\ \text{(iii) Dividend Payout Ratio} &= \frac{\text{Dividend / Share}}{\text{Earning / Share}} \times 100 \\ &= \frac{0.80}{2.67} \times 100 \\ &= 29.96\% \text{ or } 30\% \text{ (Approx.)} \end{aligned}$$

Answer 5

$$\begin{aligned} \text{(i) Long Term Debt to Total assets} &= \frac{\text{Long Term Debt}}{\text{Total Assets}} \\ &= \frac{75,000}{2,50,000} \end{aligned}$$

$$= 1:3.33$$

$$\begin{aligned} \text{(ii) Net Profit Ratio} &= \frac{\text{Net Profit}}{\text{Net Sales}} \times 100 \\ &= \frac{22,500}{3,75,500} \times 100 \end{aligned}$$

$$= 6\%$$

$$\begin{aligned} \text{(iii) Return on Total Assets Ratio} &= \frac{\text{Net Profit} + \text{Interest (1-t)}}{\text{Average Total Assets}} \times 100 \end{aligned}$$

$$= \frac{22,500 + 4,000 (1-0.35)}{(2,00,000 + 2,50,000) / 2} \times 100$$

$$= \frac{25,100}{2,25,000} \times 100$$

$$= 11\%$$

$$\begin{aligned} \text{(iv) Return on Equity} &= \frac{\text{Net Profit}}{\text{Shareholder' Funds}} \times 100 \end{aligned}$$

$$= \frac{22,500}{75,000} \times 100$$

$$= 30\%$$

$$\text{(v) Net Sales to Total Assets Ratio}$$

$$= \frac{\text{Net Sales}}{\text{Total Assets}}$$

$$= \frac{3,75,000}{2,25,000}$$

$$= 1.67: 1$$