

RATIO ANALYSIS

Ratio

It is an arithmetical expression of relationship between two related or interdependent items.

Accounting Ratios It is a mathematical expression that shows the relationship between various items or groups of items shown in financial statements. When ratios are calculated on the basis of accounting information, they are called accounting ratios.

Ratio Analysis It is a technique which involves re-grouping of data by application of arithmetical relationship.

Objectives of Ratio Analysis

- (i) To know the areas of an enterprise which need more attention.
- (ii) To know about the potential areas which can be improved on.
- (iii) Helpful in comparative analysis of the performance.
- (iv) Helpful in budgeting and forecasting.
- (v) To provide analysis of the liquidity, solvency, activity and profitability of an enterprise.
- (vi) To provide information useful for making estimates and preparing the plans for future.

Advantages of Ratio Analysis

- (i) It is useful in analysis of financial statements.
- (ii) Helps in simplifying accounting figures.
- (iii) Useful in judging the operating efficiency of business.
- (iv) Helps in identification of problem areas.
- (v) Helpful in comparative analysis.

Limitations of Ratio Analysis

- (i) Accounting ratios ignore qualitative factors.
- (ii) Absence of universally accepted terminology.
- (iii) Ratios are affected by window-dressing.
- (iv) Effects of inherent limitations of accounting.
- (v) Misleading results in the absence of absolute data.
- (vi) Price level changes ignored.
- (vii) Affected by personal bias and ability of the analyst.

Expression of ratio:

Ratios are expressed in following four ways:

- **Pure Ratio:** Like 2:1. All liquidity and solvency ratios are expressed in pure form.
- **Percentage:** e.g. 15%. All profitability ratios are presented in percentage form.
- **Times** Like 4 times: All turnover ratios and Interest Coverage Ratio are presented in this form.
- **Fraction** like $\frac{3}{4}$

CLASSIFICATION OF RATIOS

Ratios can be classified into following 4 categories:

1. Liquidity Ratios
2. Solvency Ratios
3. Activity Ratios also known as turnover Ratios or Performance Ratios.
4. Profitability Ratios

A.Liquidity Ratios :

Liquidity ratios measure the firm's ability to fulfil its short-term financial obligations. Liquidity means the firm's ability to meet its current liabilities. In other words, the ability of a business to pay its short-term debts is frequently referred to as liquidity position of the business. Short term creditors of the firm are generally interested to know about the liquidity position of the firm.

The liquidity ratio is further categorised into two parts:

(i) Current Ratio

(ii) Liquid Ratio

Current Ratio/Working Capital Ratio=Current Assets/Current Liabilities

Items Included in Current Assets

- (a) Current investments
- (b) Inventories (Excluding loose tools, stores and spares)
- (c) Trade receivables (bills receivable and sundry debtors less provision for doubtful debts)
- (d) Cash and cash equivalents (cash in hand, cash at bank, cheques/drafts in hand)
- (e) Short-term loans and advances
- (f) Other current assets (prepaid expenses, interest receivable, etc.)

Items Included in Current Liabilities

- (a) Short-term borrowings
- (b) Trade payables (bills payable and sundry creditors)
- (c) Other current liabilities (current maturities of long-term debts, interest, accrued but not due on borrowings, interest accrued and due on borrowings, outstanding expenses, unclaimed dividend, calls-in-advance, etc)
- (d) Short-term provisions

2. Liquid ratio/Quick ratio/Acid test ratio

This ratio establishes relationship between liquid assets and current liabilities and is used to measure the firm's ability to pay the claims of creditors immediately. This ratio is a better indicator of liquidity and 1 : 1 is considered to be ideal.

Liquid Ratio/Quick Ratio/Acid Test Ratio=Liquid Assets or Quick Assets/Current Liabilities

Items Included in Liquid/Quick Assets

- (i) Current investments.
- (ii) Trade receivables (bill receivables, debtors less provisions for doubtful debts).
- (iii) Cash and cash equivalents.
- (iv) Short-term loans and advances.
- (v) Other current assets except prepaid expenses.

Items excluded in liquid assets are inventories, prepaid expenses.

Items Included in Current Liabilities

- (i) Short-term borrowings.
- (ii) Trade payables (bills payable and sundry creditors).
- (iii) Other short-term liabilities.
- (iv) Short-term provisions.

NUMERICAL PROBLEMS

1. from the following, calculate current ratio

Share capital	50000	fixed assets	124000
Preference share capital	30000	short term capital	10000
General reserve	40000	debtors	95000
Debentures	60000	stock	50000
Trade payables	10000	cash and bank	15000
Bank overdraft	20000	discount for share issue	6000
Provision for tax	40000	Provision for depreciation	20000

Solution:

Current Ratio = Current Assets/ Current Liabilities

Current Assets = Debtors + Stock + Cash + Short term Capital = 1,70,000

Current Liabilities = Trade Payables + Bank Overdraft + Provision for Taxes +

Provision for Depreciation = 90,000

Current Ratio = $170000/90000 = 1.889 : 1$

2. From the following calculate liquid ratio

Current Liabilities	65000
Current Assets	85000
Stock	20000
Advance tax	5000
Prepaid Expenses	10000

Solution:

Quick Ratio = Quick Assets / Current Liabilities

Quick Assets = All Current Assets – Stock – Prepaid Expenses

= $85000 - (20000 + 5000 + 10000) = 50,000$

Quick Liabilities = All Current Liabilities – Bank Overdraft – Cash Credit = 65,000

Quick Ratio = $50000/65000 = 0.77:1$

B) Solvency Ratios:

A company usually does not only run on owner's fund. Most **companies** have a debt factor, whether it is **loans**, deposits, debentures etc. So a check has to be kept on the cost of such **debt** and whether the company is capable of meeting such costs. This is where solvency ratios are useful. Solvency ratios also known as leverage ratios determine an entity's ability to service its debt. So these ratios calculate if the company can meet its long-term debt.

TYPES OF SOLVENCY RATIOS

1] Debt to Equity Ratio

The debt to equity ratio measures the relationship between long-term debt of a firm and its total equity. Since both these figures are obtained from the balance sheet itself, this is a balance sheet ratio. Let us take a look at the formula.

1. Debt to Equity Ratio = Long-Term Debt / Shareholders Funds

Long Term Debt = Debentures + Long Term Loans

Shareholders' Funds = Equity Share Capital + Preference Share Capital + Reserves –

Fictitious Assets

The debt-equity ratio holds a lot of significance. Firstly, it is a great way for the company to measure its leverage or indebtedness. A low ratio means the firm is more financially secure, but it also means that the equity is diluted.

2. Total Assets to Debt Ratio:

This ratio is a variation of the debt equity ratio and gives the same indication as the debt equity ratio. In this ratio, total assets are expressed in relation to the long term debts. It is

calculated as under

$$\text{Total Assets to Debt Ratio} = \text{Total Assets} / \text{Debt}$$

Or

$$\text{Total Assets} / \text{Long Term Debts}$$

this ratio is usually expressed as a pure ratio is 1:1 or 2:1

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

$$\text{Debts} = \text{Long Term Borrowings} + \text{Long Term Provisions}$$

3. Proprietary Ratio :

The third of the solvency ratios is the proprietary ratio or equity ratio. It

expresses the relationship between the proprietor's funds, i.e. the funds of all

the shareholders and the capital employed or the net assets. Like the debt ratio

shows us the comparison between debt and capital, this ratio shows the

comparison between owners funds and total capital or net assets. The ratio

is as follows,

$$\text{Proprietary Ratio} = \text{Shareholders Funds} / \text{Capital Employed}$$

OR

$$\text{Shareholders Funds} / \text{Net Assets}$$

A high ratio is a good indication of the financial health of the firm. It means that a larger portion of the total capital comes from equity. Or that a larger portion of net assets is financed by equity rather than debt. One point to note,

that when both ratios are calculated with the same denominator, the sum of debt ratio and the proprietary ratio will be 1.

4] Interest Coverage Ratio

All debt has a cost, which we normally term as an interest.

Debentures, loans, deposits etc all have an interest cost. This ratio will measure the security of this interest payable on long-term debt. It is the ratio between the profits of a firm available and the interest payable on debt instruments. The formula is,

Interest Coverage Ratio = Net Profit before Interest and Tax/Interest on

Long-Term Debt

Numerical Problem

1. From the following information calculate Debt equity Ratio:-

Share capital: 10000 shares of RS 10 each 100000

General Reserve : 45000

Surplus : 30000

Debentures : 75000

Long term Provisions : 25000

Outstanding expenses : 10000

Solution:

Debt to equity ratio = Debt / Equity (shareholder funds) = 1,00,000 / 1,75,000 = 0.57 : 1

Debt = Debentures + Long term provisions = 75,000 + 25,000 = 1,00,000

Equity = Share Capital + General Reserve + Surplus = 1,00,000 + 45,000 + 30,000 = 1,75,000

2. From the following information calculate total assets to debt ratio

Shareholders' funds Rs. 1,40,000

Total Debts (Liabilities) Rs. 18,00,000

Current Liabilities = Rs. 2,00,000.

Solution:

Total Assets to debt ratio = Total Assets / Long term Debts

= 32,00,000 / 16,00,000 = 2 : 1

Long term debts = total debts (Liabilities) – Current Liabilities

= 18,00,000 – 2,00,000 = 16,00,000

Total assets = shareholder funds + total debts (liabilities)

3. From the following calculate Proprietary ratio

Long term borrowings	100000
Long term provisions	50000
Current liabilities	25000
Non current assets	180000
Current assets	45000

Solution :

Proprietary ratio = Share holders fund / total assets

Shareholders fund = 50000

Total assets = 225000

Proprietary Ratio = $50000/225000 = .22:1$

4: Calculate Interest Coverage ratio from the following details

- i. NPAT is 97,500
- ii. Tax Rate is 35%
- iii. Debentures are 6,00,000 at 10%

Solution:

NPAT = 1,25,000

Tax Rate = 35%

Net Profit before tax = $(97500 \times 100) \div 65$

Net Profit Before tax = 1,50,000

Debentures Interest = $6,00,000 \times 10\% = 60,000$

Interest Coverage Ratio = $\frac{\text{Net Profit before Interest and Tax}}{\text{Interest on Long-Term Debt}} = \frac{150,000}{60,000} = 2.5:1$

Interest Coverage Ratio = 2.5:1

So in the current earnings before interest and tax, the firm can cover the interest cost for 2.5 times.

C. Activity Ratios or Turnover Ratios :

Activity / Turnover Ratios are a set of financial ratios used to measure the efficiency of various operations of a business. Activity ratios measure the efficiency of the firm in using its resources/ assets. These ratios are also known as Asset Management Ratios because these ratios indicate the efficiency with which the assets of the firm are

/utilized. The efficiency is measured in terms of generation of revenue by the respective assets. These ratios are also known as performance/ ratios. There are four types of Activity Ratios:

1. Inventory Turn over ratio:

Inventory turnover ratio indicates how many times inventory is sold and replaced in a financial year. In other words, the ratio gives the frequency of conversion of inventory into cash in a given financial year. Normally, a higher ratio is considered good as it suggests better inventory management.

Inventory turnover ratio = $\frac{\text{Cost of Revenue from Operation}}{\text{Average Inventory}}$

Cost of revenue from operation = Revenue from operation – Gross profit

or

$\frac{\text{Revenue from operation} + \text{gross loss}}{\text{Average Inventory}}$

Or

$\frac{\text{Opening inventory} + \text{purchases} + \text{carriage} + \text{wages} + \text{direct charges} - \text{closing stock}}{\text{Average Inventory}}$

2. Accounts Receivables turn over ratio:

The accounts receivables turnover ratio, also known as debtor's ratio, is an activity Ratio that measures the efficiency with which the business is utilizing its assets. It Measures how many times a business can turn its accounts receivables into cash. It is calculated by dividing the net credit sales during a specific period by the average

accounts receivables. The average accounts receivable is calculated by adding the value of the accounts receivable at the beginning of the desired period to the value at the end and then dividing it by two.

$$\text{Accounts Receivable Turnover} = \frac{\text{Net Credit Revenue from operation}}{\text{Average Accounts Receivable}}$$

The ratio indicates the efficiency with which the business is able to collect credit it issues its customers.

While a high ratio may indicate the company operates on a cash basis or has quality customers that pay off their debts quickly, a low ratio can suggest a bad credit policy and poor collecting process. It helps in assessing if its credit policies are helping or hurting the business.

3. Accounts Payable Turnover Ratio :

The accounts payable turnover ratio is a [short-term liquidity](#) measure used to quantify the rate at which a company pays off its suppliers. Accounts payable turnover shows how many times a company pays off its accounts payable during a period.

$$\text{Accounts Payable Ratio} = \frac{\text{Net Credit Purchase}}{\text{Average Accounts Payable}}$$

[Accounts payable](#) are short-term debt that a company owes to its suppliers and

creditors. The accounts payable turnover ratio shows how efficient a company is at paying its suppliers and short-term debts.

4. WORKING CAPITAL TURNOVER RATIO

The working capital turnover ratio indicates a business effectiveness in utilizing its working capital. Working capital is the total amount of current assets minus the current liabilities. The ratio is calculated by dividing the net sales by the working capital. The ratio helps you figure out the net annual sales generated by the average amount of working capital during a year.

$$\text{Working Capital Ratio} = \text{Net Sales} / \text{Working Capital}$$

A high working capital ratio shows that the business is efficiently using its short-term liabilities and assets for supporting sales. A low ratio could indicate bad debts or obsolete inventory.

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Numerical Problems

1. Calculate inventory turnover ratio of XYZ Ltd. As per the given Information:

Opening inventories	50,000
Closing inventories	60,000
Cost of goods manufactured	4,90,000

Solution:

$$\text{Cost of goods sold} = 50,000 + 4,90,000 - 60,000 = 4,80,000$$

$$\text{Average inventories} = (50,000 + 60,000) / 2 = 55,000$$

$$\text{Inventory turnover ratio} = 4,80,000 \div 55,000 = 8.73$$

2. Calculate Accounts Receivable Turnover Ratio and Average Collection

Period (in days) from the following.

Total Sales – 6,00,000

Cash Sales – 20% of Total sales

Trades Receivable at beginning of the year- 80,000

Trades Receivable at the end of the year- 1,60,000

Solution: From the given information

$$\text{Credit Sales} = 80\% \text{ of Total Sales} = 80\% \text{ of } 6,00,000 = 4,80,000$$

$$\text{Average Debtors} = \text{Opening Debtors} + \text{Closing Debtors} / 2$$

$$= 80,000 + 1,60,000 / 2 = 1,20,000$$

$$\text{Debtors Turnover ratio} = \text{Credit Sales} / \text{Average Debtors}$$

$$= 480,000 / 1,20,000$$

$$= 4 \text{ times}$$

$$\text{Average Collection Period} = \text{Number of days/weeks/months} / \text{Debtors T/O Ratio}$$

$$= 365 / 4$$

$$= 91.25 \text{ days} = 92 \text{ days}$$

3. XYZ has the following result of the previous financial year, calculate Accounts Payable Turnover Ratio

Opening Creditors	30,000
Closing Creditors	50,000
Credit Purchase	5,00,000

Solution:

$$\text{Average Creditors} = (30,000 + 50,000) / 2 = 40,000$$

$$\text{Creditors Turnover ratio} = 5,00,000 / 40,000 = 12.5$$

4. Calculate Working Capital Turnover ratio of XYZ Ltd. As per the given Information:

Net Sales	5,00,000
Current Asset	10,00,000
Closing Creditors	7,50,000

Solution:

Working Capital = $10,00,000 - 7,50,000 = 2,50,000$

Working Capital Turnover Ratio = $5,00,000 / 2,50,000 = 2$

D) Profitability Ratios:

Profitability ratio is used to evaluate the company's ability to generate income as compared to its expenses and other cost associated with the generation of income during a particular period. This ratio represents the final result of the company.

There are five types of Profitability Ratios:

1. Gross Profit Ratio:

Gross profit ratio is typically the first profitability ratio calculated by businesses. It measures how much sales income a company has left over after it covers the cost of goods sold (COGS). This figure is known as a company's gross profit ratio.

You can calculate your company's gross profit ratio with the formula below. The initial figures you need to complete the formula should be available on your business' [income statement](#).

Gross Profit Ratio = $\text{Gross Profit} / \text{Revenue From Operations} * 100$

A higher gross profit margin indicates that you have more money left over to cover operating expenses. A higher gross profit margin may also result in higher ending profits for owners and shareholders.

2. Net Profit Ratio:

As a small business owner, the profitability measurement that may matter most to you is your company's net profit ratio. It reveals how much of the money your company earns makes its way to the bottom line.

Specifically, net profit ratio shows the percentage of profit your company keeps from its sales revenue after all expenses (operating and non-operating) are paid.

$$\text{Net Profit Ratio} = \text{Net Profit} / \text{Revenue From Operations} * 100$$

A high net profit ratio typically indicates a company that is operating successfully. Your business is doing a good job managing costs and pricing its goods or services.

3. Operating Ratio :

Operating profit, or earnings before interest and taxes (EBIT), takes your gross profit and deducts operating expenses. These expenses may include commissions, administrative expenses, and other general costs.

A company's operating profit reveals how much revenue is left over after it covers both

COGS and operating expenses. The operating profit ratio shows the percentage of revenue that remains once these costs are deducted from your net sales.

You can calculate your company's operating profit ratio using the formula below. Again, both initial figures you need for your calculations may appear on your company's income statement.

$$\text{Operating Profit Ratio} = \text{Operating Profit/Revenue From Operation} * 100$$

If your company shows a low operating profit ratio (especially if your gross profit ratio is healthy), it might be a sign that you're spending too much on operating costs.

4. Operating Ratio:

The operating ratio shows the efficiency of a company's management by comparing the total [operating expense](#) (OPEX) of a company to net sales. The operating ratio shows how efficient a company's management is at keeping costs low while generating revenue or sales. The smaller the ratio, the more efficient the company is at generating revenue vs. total expenses.

$$\text{Operating Ratio} = \frac{\text{Costs of Revenue from Operation} + \text{Operating Expenses} - \text{Operating Income}}{\text{Revenue from Operation}} * 100$$

Expenses-Operating Income

*100

Revenue from Operation

Operating profit = **Gross profit** - Operating Expenses

OR

Operating profit = Net sales - Operating cost

OR

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

OR

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

Higher the ratio, better it is

5. Return On Investment :

Return on Investment (ROI) is a performance measure used to evaluate the efficiency of an investment or compare the efficiency of a number of different investments. ROI tries to directly measure the amount of return on a particular investment, relative to the investment's cost. To calculate ROI, the benefit (or return) of an investment is divided by the cost of the investment. The result is expressed as a percentage or a ratio.

Return On Investment = $\frac{\text{Net Profit Before Interest and Tax}}{\text{Investment}}$

* 100

Capital Employed

Numerical Problems

1. The following data relates to a small trading company. Compute the gross profit ratio (GP ratio) of the company.

- Gross sales: 1,000,000
- Sales returns: 90,000
- Cost of goods sold: 675,000

Solution:

With the help of above information, we can compute the gross profit ratio as follows:

$$\begin{aligned}\text{Gross Profit Ratio} &= (235,000^* / 910,000^{**}) \\ &= 0.2582 \text{ or } 25.82\%\end{aligned}$$

$$\begin{aligned}^* \text{Gross profit} &= \text{Net sales} - \text{Cost of goods sold} \\ &= 910,000 - 675,000 \\ &= 235,000\end{aligned}$$

$$\begin{aligned}^{**} \text{Net sales} &= \text{Gross sales} - \text{Sales returns} \\ &= 1,000,000 - 90,000 \\ &= 910,000\end{aligned}$$

The GP ratio is 25.82%. It means the company may reduce the selling price of its products by 25.82% without incurring any loss.

2. The following data has been extracted from [income statement](#) of Albari corporation.

Gross sales: 210,000

Returns inwards: 10,000

Net profit before tax: 50,000

Income tax: 10%

Required: Compute net profit ratio of Albari corporation using above information.

Solution:

$$\begin{aligned}\text{Net Profit Ratio} &= (45,000^* / 200,000^{**}) \\ &= 0.225 \text{ or } 22.5\%\end{aligned}$$

*Net profit after tax:

$$\begin{aligned}&= 50,000 - (50,000 \times 0.1) \\ &= 45,000\end{aligned}$$

** Net sales:

$$\begin{aligned}&= 210,000 - 10,000 \\ &= 200,000\end{aligned}$$

3. The selected data from the records of Good Luck Company limited is given below:

- Net sales: 400,000
- Cost of goods sold: 160,000
- Administrative expenses: 35,000
- Selling expense: 25,000
- Interest charges: 10,000

Required: Compute operating ratio for Good Luck Company Limited from the above data.

Solution:

$$\begin{aligned} &= (220,000^* / 400,000) \times 100 \\ &= 55\% \end{aligned}$$

The operating profit ratio is 55%. It means 55% of the sales revenue would be used to cover cost of goods sold and other operating expenses of Good Luck Company Limited.

*Computation of operating expenses:

Cost of goods sold + Administrative expenses + Selling expenses

$$\begin{aligned} &= 160,000 + 35,000 + 25,000 \\ &= 220,000 \end{aligned}$$

4. Calculate Operating Profit Ratio

Particulars	Amt	Particulars	Amt
Sales less returns	4,00,000	Selling expenses	25,000
Gross profit	1,40,000	Income from investment	1,000
Administration expenses	35,000	Loss on account of fire	2,000

Solution:

Operating profit = Gross profit - Administration and selling expenses

$$\begin{aligned} &= 1,40,000 - (35,000 + 25,000) \\ &= 1,40,000 - 60,000 \\ &= 80,00 \end{aligned}$$

Operating profit ratio = $(80,000 / 4,00,000) \times 100$

= 20 %

5. A company has a loan of Rs 2000000 as part of its capital employed. The interest payable on the loan is 15% and the ROI of the company is 25%. The ratio of income tax is 40%. What is the gain to the shareholders due to the loan raised by the company?

Return on Investment = $\text{Net profit before interest and tax} / \text{capital employed} \times 100$

Since capital employed is given in the question RS 2000000 and ROI is 25%

Net Profit before interest and tax = $2000000 \times 25 / 100 = \text{RS } 500000$

Less: interest at 15% of RS 2000000 = RS 300000

Profit after interest = RS 200000

Less : Tax paid 40% of RS 200000 = RS 80000

Net gain to shareholders = Rs 120000

