
Chapter 4: Ratio Analysis – Part II

Ex 4-2.1: Profitability Ratios

Profitable Ratios are a class of financial metrics that are used to assess a business's ability to generate earnings as compared to its expenses and other relevant costs incurred during a specific period of time.

It is the amount of profit (at the gross, operating, or net income level) generated by the company as a percentage of the sales generated.

The profitability of a company is important to the company and its shareholders. These ratios provide an understanding of whether the company has utilized its resources well to generate profit and increase shareholders' value.

Profitability ratios help to determine whether the profitability of a company was consistent and whether the profit trends in a company's earnings were positive or negative. Positive profit margin results into positive investment quality and this positive quality drives the stock price of a company to a large extent.

Objectives:

- The profitability of a company was consistent.
- The profit trends in a company's earnings were positive or negative.
- It shows the amount of profit (at the gross, operating, or net income level) generated by the company as a percentage of the sales generated.
- These ratios are used to assess a business's ability to generate earnings as compared to its expenses.

Gross Profit Margin

Gross profit margin is a financial metric which measures the profit in relation to sales. It is used to assess a firm's financial health by revealing the proportion of money left over from revenues after accounting for the cost of goods sold.

Gross profit margin is an indicator that assesses the profitability of a company's core activity, excluding the fixed cost.

Gross profit margin serves as the source for paying additional expenses and future savings.

Gross profit margin can be calculated using the formula:

$$\text{Gross profit margin} = (\text{Net sales} - \text{Cost of goods sold [COGS]}) / \text{Net sales} \times 100$$

Or

$$(\text{Gross Profit} / \text{Net Sales}) \times 100$$

Example: 01

Net Sales Rs. 10,65,000

Cost of goods sold Rs. 8,05,000

Calculate Gross profit rate.

Solution:

$$\begin{aligned} \text{Gross Profit} &= \text{Net Sales} - \text{Cost of Goods sold} \\ &= 10,65,000 - 8,05,000 \\ &= 2,60,000 \end{aligned}$$

$$\begin{aligned}\text{Gross Profit Ratio} &= \text{Gross profit} / \text{Net Sales} \times 100 \\ &= 2,60,000 / 10,65,000 \times 100 \\ &= 24.41\%\end{aligned}$$

Net Profit Margin

It is a financial metric which measures the net profit of a firm in relation to sales.

Net profit margin is a key financial indicator used to assess the profitability of a company.

Objectives:

- It is a financial metric which measures the net profit of a firm in relation to sales.
- It is a key financial indicator used to assess the profitability of a company.
- It determines how much of each dollar of sales is left over for the owners after all expenses and taxes.

$$\text{Net profit margin} = [\text{Net profit after taxes (PAT)} / \text{Net sales}] \times 100$$

Example: 02

Net Sales	Rs. 10,65,000
Cost of goods sold	Rs. 8,05,000
Operating Expenses	Rs. 1,10,000 Tax 40%

Calculate Net Profit Margin.

Solution:

$$\begin{aligned}\text{Gross Profit} &= \text{Net Sales} - \text{Cost of Goods sold} \\ &= 10,65,000 - 8,05,000 \\ &= 2,60,000\end{aligned}$$

$$\begin{aligned}\text{Net Profit} &= (\text{Gross Profit} - \text{Operating Expenses}) - \text{Taxation} \\ &= (2,60,000 - 1,10,000) - (1,50,000 \times 40\%) \\ &= 1,50,000 - 60,000 \\ &= 90,000\end{aligned}$$

$$\begin{aligned}\text{Net Profit Margin} &= \text{Net Profit} / \text{Net Sales} \times 100 \\ &= 90,000 / 10,65,000 \times 100 \\ &= 8.45\%\end{aligned}$$

Expense Ratios

- It measures how efficiently a business is managing its expenditures in comparison to sales.
- These are used to ascertain the relationship between operating expenses and volume of sales.
- It is also known as Management Expense Ratio (MER) in the mutual fund and investment industry.
- Expenses ratios are of the following types:
 - a. Operating ratio
 - b. COGS ratio
 - c. Specific expenses ratio

Operating Ratio

It measures the cost of operations per dollar of sales.

It is generally expressed in percentage. It is used to ascertain the relationship between operating expenses and volume of sales.

Operating ratio is the ratio of cost of goods sold plus operating expenses to net sales. The formula for operating ratio:

$$\text{Operating ratio} = [(\text{Cost of goods sold} + \text{Operating expenses}) / \text{Net sales}] \times 100$$

Operating ratio has two basic components, operating cost (cost of goods sold plus operating expenses) and net sales.

Operating expenses normally include:

- Administrative and office expenses
- Selling and distribution expenses

Financial charges such as interest, provision for taxation, etc., are generally excluded from operating expenses.

NOTE

- Operating ratio shows the operational efficiency of a business. A low operating ratio shows a high operating profit and vice versa.
- An operating ratio ranging between 75% and 80% is generally considered as a standard for manufacturing concerns. This ratio is considered to be a yardstick of operating efficiency but it should be used cautiously because it may be affected by a number of uncontrollable factors beyond the control of the firm.
- In some firms, non-operating expenses form a substantial part of the total expenses and, in such cases, operating ratio may give misleading results.

COGS Ratio

Cost of Goods sold ratio (COGS) measures the cost of goods sold per sale. This means that it shows the percentage of sales revenue used to pay for expenses which vary directly with sales.

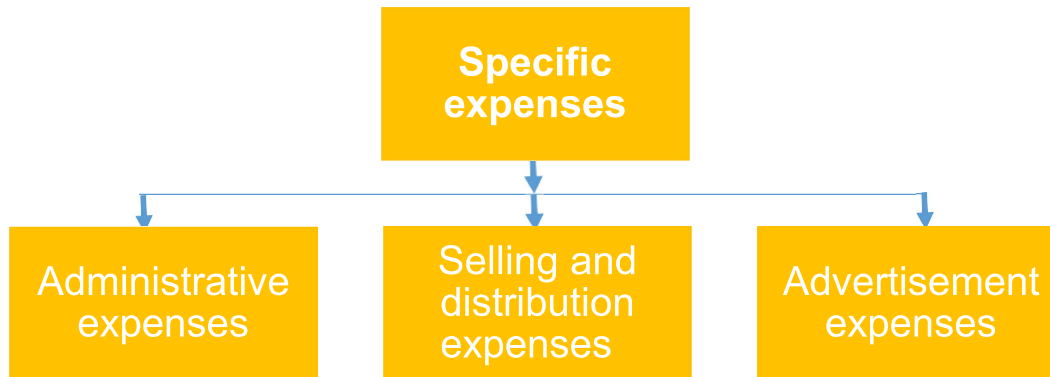
COGS ratio is calculated using the formula: COGS = Cost of goods sold / Sale

Specific Expenses Ratio

It measures the specific expenses per sales.

Specific expenses refer to expenditures such as administrative expenses, selling and distribution expenses, advertisement expenses, etc. If the management wants to know how much of a particular expenditure is being incurred with respect to sales, the specific expense ratio is calculated.

Specific expenses ratio = Specific expenses / Sales



Example: 03

Net Sales	Rs. 10,65,000
Cost of goods sold	Rs. 8,00,000
Gross Profit	Rs. 2,65,000
EBIT	Rs. 1,70,000
Operating Expenses	Rs. 90,000

Calculate: i) COGS Ratio
 ii) Operating Ratio

Solution:

i) $\text{COGS Ratio} = \text{Cost of goods sold} / \text{Net Sales} \times 100$
 $= 8,00,000 / 10,65,000 \times 100$
 $= 75.11\%$

ii) $\text{Operating Ratio} = [(\text{Cost of goods sold} + \text{Operating expenses}) / \text{Net sales}] \times 100$
 $= [(800,000 + 90,000) / 10,65,000] \times 100$
 $= 83.57\%$

Example: 04

The following information relates to Blueberry Café for the year ended 31 Dec 2012:

- Rental expenses = \$24,000
- Electricity = \$10,000
- Advertising = \$3,500
- Salaries = \$15,000
- Postage = \$500

Net sales = Total sales - Sales returns = \$94,500 - \$4,500 = \$90,000

Calculate Total expenses Ratio.

Solution:

Overhead expenses = Rental + Electricity + Advertising + Salaries + Postage = \$24,000 + \$10,000 + \$3,500 + \$15,000 + \$500 = \$53,000

Overhead expense ratio
= $(\$53,000 / \$90,000) * 100$
= **58.89%**

Example: 05

Calculate the following ratios with the below information:

- Operating ratio
- Cost of goods sold ratio
- Administration expenses ratio
- Selling and distribution expenses ratio

Particulars	\$	\$
Cost of production		1,920,000
Operating expenses		
Administration expenses	330,000	
Selling and distribution expenses	50,000	380,000
Operating cost		2,300,000
Sales		2,400,000

Solution:

- (i) Operating ratio 95.83%
- (ii) Cost of goods sold ratio 80%
- (iii) Administration expenses ratio 13.75%
- (iv) Selling and distribution expenses ratio 2.08%

Ex 4-2.2: Return on Investment (ROI)

It analysis is one of several popular financial metrics for evaluating the financial consequences of business investments, decisions, or actions.

ROI is also known as simple ROI or cash on cash analysis.

As a cash flow metric, the ROI analysis compares the magnitude and timing of investment gains directly with the magnitude and timing of investment costs. A high ROI means that investment gains compare favorably to investment costs.

ROI = (Net profits - Investments) / Investments x 100

Calculating simple ROI for cash flow and investment analysis

Return on investment is frequently derived as the “return” (incremental gain) from an action divided by the cost of that action. That is “simple ROI,” as used in business case analysis and other forms of cash flow analysis.

For Blueberry Café, the ROI for the marketing program can be calculated as:

Example: 06

Cost of new project Rs. 500,000

Profit of the company Rs. 700,000

Calculate ROI.

Solution:

$$= (\$700,000 - \$500,000) / \$500,000 \times 100$$

$$= \$200,000 / \$500,000 \times 100$$

$$= 40\%$$

Ex 4-2.3: Return on Assets (ROA)

- ROA is an indicator of how profitable a company is relative to its total assets. ROA gives an idea as to how efficient management is at using its assets to generate earnings.
- ROA is calculated by dividing a company's annual earnings by its total assets and is a percentage value.
- While ROI is a mechanism used by CFO and finance analysts to view the viability of a given investment, another important ratio called return on assets (ROA) is a review mechanism used after the investment is made.

$$\text{ROA} = (\text{Net Income} / \text{Total Assets}) \times 100$$

If Profits Rs. 81,000 and Total Assets are Rs. 750,000

$$\text{ROA for Blueberry Café} = (\$81,000 / \$750,000) \times 100 = 10.8\%$$

The ROA value gives investors an idea of how effectively the company is converting the money it has to invest into net income.

The higher the ROA, the better because the company is earning more money on less investment.

Example: 07

Company A has a net income of \$1 million and total assets of \$5 million, its ROA is 20%.

However, if another company B earns the same amount but has total assets of \$10 million, it has an ROA of 10%.

Therefore, company A is better at converting its investment into profit. This also means that the management of Company A is making wise choices in allocating its resources.

Ex 4-2.4: Return on Capital Employed (ROCE)

It is a ratio that indicates the efficiency and profitability of a company's capital investments.

ROCE should always be higher than the rate at which the company borrows, otherwise, any increase in borrowing will reduce shareholders' earnings. The higher the ROCE ratio, the more efficient is the usage of the capital employed.

ROCE is calculated as:

$$\text{ROCE} = \text{Net operating profit} / \text{Capital employed}$$

where,

Net operating profit is the EBIT.

Capital employed is the difference of total assets and the current liabilities.

A variation of this ratio is return on average capital employed (ROACE), which takes the average of opening and closing capital employed for the time period.

Example: 08

- Total assets = Rs. 750,000
- Net Operating Profit = Rs. 170,000
- Current liabilities = Rs. 150,000

Solution:

The capital employed will be:

$$= \text{Rs. } (750,000 - 150,000) = \text{Rs. } 600,000$$

ROCE

$$= 170,000 / 600,000 \times 100$$

$$= \mathbf{28.33\%}$$

Ex 4-2.5: Return on Equity

Return on equity (ROE) measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested. Return on equity concentrates only on the return on the shareholders' money or the amount of net income returned as a percentage of shareholders' equity.

ROE is also known as Return On Net Worth (RONW).

ROE is expressed as a percentage and calculated as:

$$\text{Return on Equity} = \text{Net Income} / \text{Shareholder's Equity}$$

Net income is for the full fiscal year (before dividends paid to common stockholders but after dividends to preferred stockholders.) Shareholders' equity does not include preferred shares.

Example: 09

Blueberry Café contains Share Capital of \$125,000 and Reserves \$2,55,000. Net profit of the year \$135,000. Calculate Return on Equity.

Solution:

$$\text{Shareholder's equity} = \text{Share capital} + \text{Reserves} = \$1,25,000 + \$2,55,000$$

$$\text{Net profit} = \$135,000$$

$$\text{ROE} = \$135,000 / \$380,000 = 35.53\%$$

$$\text{So, ROE will be } \$135,000 / \$380,000$$

$$= \mathbf{35.53\%}$$

Ex 4-2.6: Earnings Per Share (EPS)

- It is a measure of the profit available to the equity holders on a per share basis.
- It indicates how efficiently a company has been able to generate income for its shareholders.
- It is the most important variable in determining the price of a share.

EPS = (Net income – Dividend on preferred stock) / Average outstanding shares

A set of ratios are used by the shareholders of a company to judge a company's worth and the potential of its shares. These ratios are collectively known as shareholders' ratios. Let's look at each of these ratios.

Earnings per share (EPS) is a measure of the profit available to the equity holders on a per share basis or the measure of the portion of a company's profit allocated to each outstanding share of common stock.

EPS serves as an indicator of a company's profitability in the sense how efficiently the company has been able to generate income for its shareholders.

When calculating EPS, it is more accurate to use a weighted average number of shares outstanding over the reporting term, because the number of shares outstanding can change over time. However, data sources sometimes simplify the calculation by using the number of shares outstanding at the end of the period.

EPS is generally considered to be the single most important variable in determining the price of a share. It is also a major component used to calculate the price-to-earnings valuation ratio.

For example, a company has a net income of \$25 million. If the company pays out \$1 million in preferred dividends and has 10 million shares for half of the year and 15 million shares for the other half, the EPS would be \$1.92 (24/12.5). This is calculated in two steps:

1. The \$1 million is deducted from the net income = \$24 million
2. A weighted average is taken to find the number of shares outstanding = $(0.5 \times 10M + 0.5 \times 15M = 12.5M)$

In the example of Blueberry Café, the total share capital is \$125,000. If each share is of \$100, the total issued shares of Blueberry Café will be 1250.

We know the Net Profit after Tax is \$81,000. Therefore:

$$\text{EPS} = \$81,000 / 1250 = \$64.80$$

Or

Example: 10

Total share capital = \$125,000

Each share = \$100

Total issued shares = 1,250

PAT = \$81,000

EPS = \$81,000 / 1,250 = \$64.80

Ex 4-2.7: Dividend Per Share (DPS)

Dividend per share (DPS) is the total dividends paid out over an entire year (including interim dividends, but not including special dividends) divided by the number of outstanding ordinary shares issued.

DPS is considered by investors to take investment decisions in a particular stock, such as pensioners, fixed income earners, etc., who would like to invest in shares which have a history of high DPS over the years.

DPS can be calculated by using the following formula:

$$\text{DPS} = (\text{D} - \text{SD}) / \text{S}$$

D - Sum of dividends over a period (usually 1 year)

SD - Special, one time dividends

S - Shares outstanding for the period

A high DPS is often considered greater stability of a company.

For example, A1B1 company paid a total of \$237,000 in dividends over the last year, of which there was a special one-time dividend totaling \$59,250. ABC has 2 million shares outstanding. Therefore, its DPS would be:

$$= (\$237,000 - \$59,250) / 2,000,000 = \$0.0889 \text{ per share}$$

If Blueberry Café declares a total dividend of \$40,000, the DPS will be:

$$= \$40,000 / 1250 = \$32$$

Dividends are a form of profit distribution to the shareholder. Having a growing dividend per share can be a sign that the company's management believes that the growth can be sustained.

Note:

The DPS ratio is similar to EPS. EPS shows what shareholders earned by way of profit for a period whereas DPS shows how much the shareholders were actually paid by way of dividends.

Dividend Payout Ratio (D/P)

- Is a measure of the percentage of earnings paid to shareholders in dividend
- Is one of the key factors for movement in share price
- Can be calculated easily from the company's financial and annual reports

Is calculated as:

$$\text{D/P} = \text{Yearly DPS} / \text{EPS}$$

OR

$$\text{D/P} = \text{Dividends} / \text{Net income}$$

Note:

- A reduction in dividends paid is looked poorly upon by investors. The stock price usually depreciates as investors seek other dividend-paying stocks.
- A stable dividend payout ratio indicates a solid dividend policy by the company's board of directors.

Steps for Calculating D/P Ratio

Step 1

Determine a company's total annual dividends paid and net income from its financial reports. The net income represents the profits after expenses are paid. This information is available from online financial websites or through your investment broker.

Step 2

Divide the dividend payout by the net income to calculate the dividend payout ratio. As an example, if the company pays \$10 million in dividends and has a net profit of \$22 million, divide \$10 million by \$22 million to calculate a dividend payout ratio of 0.45.

Step 3

Multiply the D/P ratio by 100 to convert the ratio into percentage format. Continuing with the example, multiply 0.45 times 100 to convert the ratio to 45%.

Example: 11

If DPS of the company is Rs. 32 and EPS Rs. 64.8, then find the D/P ratio.

$$\begin{aligned} \text{The D/P ratio} \\ &= 32/64.8 \times 100 \\ &= 49.38\% \end{aligned}$$

Dividend Yield

It is a financial ratio that shows how much a company pays out in dividends each year relative to its share price. In the absence of any capital gains, the dividend yield is the return on investment for a stock.

Dividend yield is calculated as follows:

$$\text{Dividend yield} = (\text{Annual DPS} / \text{MPS}) \times 100$$

Example: 12

$$\begin{aligned} \text{Mr. John has} &= 500 \text{ shares} \\ \text{Dividend} &= \$32 \text{ per share} \\ \text{Current stock price} &= \$150 \\ \text{Dividend yield on stock} &= (\$32 / \$150) \times 100 \\ &= 21.33\% \end{aligned}$$

Earning Yield/Earning Price Ratio

Earning yield is the ratio between divisible profit per share and market price per share.

It is usually expressed in percentage. It indicates the divisible profit earning capacity of a company in relation to the market price of its shares. The higher the ratio, the more profitable are the shares for investment, since they are considered less risky.

$$\text{Earning yield} = (\text{Earning per share} / \text{Market price per share}) \times 100$$

Example: 13

$$\begin{aligned} \text{EPS} &= \$64.80 \\ \text{Market price of shares} &= \$150 \text{ per share} \\ \text{Earning yield} &= (\$64.80 / \$150) \times 100 \\ &= 43.2\% \end{aligned}$$

Here, the shareholders enjoy 43.2% return on the market price of their holdings.

Price/Earning (P/E) Ratio

1. It is a ratio between market price per share compared to its earnings per share.
2. It is the reciprocal of Earning Yield ratio.

$$\text{P/E ratio} = (\text{MPS} / \text{EPS}) \times 100$$

Example: 14

$$\begin{aligned} \text{EPS} &= \$64.80 \\ \text{MPS} &= \$150 \text{ per share} \\ \text{P/E ratio} &= \$150 / \$32.8 \\ &= 231.48\% \end{aligned}$$

Earning Power

Earning power is used to analyze stocks to assess whether the underlying company is worthy of investment. Possessing greater long-term earning power is one indication that a stock may be a good investment.

It actually measures the overall profitability and operational efficiency of a business. The higher the earning power ratio, the more effective a company is at generating income from its assets.

The earning power ratio is Earnings Before Interest and Taxes (EBIT) divided by total assets, i.e.:

$$\text{Earning Power} = \text{EBIT} / \text{Total Assets}$$

Example: 15

Blueberry Café has EBIT of \$170,000 while its total assets are \$750,000.

The company's net income for the same period is \$81,000.

Basic Earning Power (BEP) ratio

$$= \text{EBIT} (\$170,000) / \text{Total Assets} (\$750,000) = 22.67\%$$

ROA ratio / Earning Power

$$= \text{Net income} (\$81,000) / \text{Total assets} (\$750,000) = 10.8\%$$

Basic earning power ratio tells that the company has a raw earning power of 22.67%. Since its return on assets is 10.8%, it can be concluded that 11.87% (22.67% - 10.8%) of the company's revenue is expensed out as interest expense and taxes.

Summary

In this chapter, you learned that:

- Profitability ratios are categorized into:
 - Gross profit margin
 - Net profit margin
- Expense ratios are of the following types:
 - Operating ratio
 - COGS ratio
 - Specific expenses ratio
- ROI, ROA, ROCE, and ROE are some of the most powerful ratios used to judge the efficiency of management.
- EPS is a measure of a company's profitability.
- DPS is a measure of a company's stability
- D/P ratio is one of the key factors for movement in share price.
- Dividend yield has an inverse relationship with the market price of a share.
- Earning yield indicates the profitability of a company from the perspective of the investors.
- P/E ratio is a ratio between market price per share compared to its earnings per share.
- Earning power is a ratio used to determine whether a stock is investment worthy.

Questions Based on this Chapter

1. List out four types of turnover ratios.
2. List out two liquidity Ratios.
3. How to calculate Operating Ratio?
4. Give a brief note on ROI.
5. Find out the current Assets and Current Liabilities. Net working Capital is Rs. 200,000 and Current Ratio is 3:2.
6. Calculate ROA:
Net Income = \$ 81,000
Fixed Assets = \$500,000
Current Assets = \$250,000
7. Find out Sales figure with given data:
Gross Profit margin 30%
Net Profit margin 12%
Net Operating Expenses \$72,000
8. Which ratio is an indicator of how profitable a company is relative to its total assets?
9. Vancount Inc. has an EBIT of \$245,654 and total assets of \$2,345,525 and current liabilities of \$786,245. Calculate its ROCE.
10.

Cash and bank Balances	\$25,000
Loans & Advances (Assets)	\$50,000
Inventory	\$160,000
Sundry Debtors	\$120,000
Current Liabilities & Provisions	\$150,000
Short term debt	\$100,000

Find out:

 - a. Net Working Capital
 - b. Current Ratio
 - c. Quick Ratio
11. Explain Gross profit and Net Profit margin.