

Financial Management

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Lecture 2

Content:

- Financial statement analysis

Financial statement analysis – Profitability ratios

The **gross (profit) margin** measures the ability to sell a product for more than the cost of producing it:

$$\text{Gross margin} = \frac{\text{Gross profit}}{\text{Sales}}$$

The **operating margin** uses instead the operating income, i.e., the earnings before interests and taxes:

$$\text{Operating margin} = \frac{\text{Operating income}}{\text{Sales}}$$

The **EBIT margin** is given by:

$$\text{EBIT margin} = \frac{\text{EBIT}}{\text{Sales}}$$

Financial statement analysis – Profitability ratios

Sometimes Operating income and EBIT are used interchangeably (and therefore also Operating margin and EBIT margin), but it is imprecise because the former does not include non-operating incomes and expenses.

The **Net profit margin** shows the fraction of each dollar in revenues that is available to equity holders after the firm pays interest and taxes:

$$\text{Net profit margin} = \frac{\text{Net income}}{\text{Sales}}$$

Financial statement analysis – Profitability ratios

The **Return on assets (ROA)** shows, in percentage, how profitable a company's assets are in generating revenue:

$$\text{ROA} = \frac{\text{Net income}}{\text{Total assets}}$$

The **Return on equity (ROE)** provides a measure of the return that the firm has earned on its past investments :

$$\text{ROE} = \frac{\text{Net income}}{(\text{Average}) \text{ shareholders' equity}}$$

Financial statement analysis – Profitability ratios

The **return on invested capital (ROIC)** measures the after-tax profit generated by the business itself, excluding any interest expenses (or income), and compares it to the capital raised from equity and debt holders that has already been deployed (i.e., not held as cash):

$$\text{ROIC} = \frac{\text{EBIT}(1 - \text{Tax rate})}{\text{Book value of equity} + \text{Debt}}$$

As $\text{EBIT}(1 - \text{Tax rate})$ gives the net operating profit after tax (NOPAT), and $\text{Book value of equity} + \text{Debt}$ is a typical way to measure invested capital, we can also write:

$$\text{ROIC} = \frac{\text{NOPAT}}{\text{Invested capital}}$$

Financial statement analysis – Liquidity ratios

Liquidity measures are used to measure the firm's ability to pay the short term obligations. From the list to the most stringent we have:

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{Inventories}}{\text{Current liabilities}}$$

$$\text{Cash ratio} = \frac{\text{Cash}}{\text{Current liabilities}}$$

Financial statement analysis – Leverage ratios

Leverage ratios are also called **debt management ratios**, and they help estimate the likelihood of default.

Leverage is the extent to which a firm relies on debt as a source of financing.

Debt to assets ratio, or **debt ratio**, is:

$$\text{Debt ratio} = \frac{\text{Total debt}}{\text{Total assets}}$$

Debt to equity ratio is:

$$\text{Debt to equity ratio} = \frac{\text{Total debt}}{\text{Total equity}}$$

Financial statement analysis – Leverage ratios

The **Liabilities to assets ratio** measures the extent to which a firm's assets are not supported by equity.

$$\text{Liabilities to assets ratio} = \frac{\text{Total liabilities}}{\text{Total assets}}$$

The **Equity multiplier** measures how much of a company's assets are financed through stockholders' equity, i.e., the amplification of the firm's accounting returns that results from leverage.

$$\begin{aligned} \text{Equity multiplier} &= \frac{\text{Return on equity}}{\text{Return on assets}} \\ &= \frac{1}{1 - \text{Liabilities to assets ratio}} \end{aligned}$$

Financial statement analysis – Efficiency ratios

Also called **Asset management ratios** or **Working capital ratios**, they measure how effectively a firm manages assets.

The **total assets turnover ratio** measures the dollars in sales generated for each dollar that is tied up in assets:

$$\text{Total assets turnover ratio} = \frac{\text{Sales}}{\text{Total assets}}$$

The fixed assets turnover ratio measures how effectively the firm uses its plant and equipment (can be sensitive to inflation, as fixed assets are reported using historical costs).

$$\text{Fixed assets turnover ratio} = \frac{\text{Sales}}{\text{Net fixed assets}}$$

Financial statement analysis – Efficiency ratios

Days sales outstanding (DSO), also called **Average collection period (ACP)**, or also **Accounts receivable days (A/R Days)** is the average length of time that the firm must wait after making a sale before receiving cash.

$$\text{DSO} = \frac{\text{Receivables}}{\text{Average sales per day}}$$

Turnover ratios are an alternative way to measure working capital. Higher turnover corresponds to shorter days, and thus a more efficient use of working capital.

Financial statement analysis – Efficiency ratios

For example, the **Inventory turnover** measures how many times a company's inventory is sold and replaced in a year.

$$\text{Inventory turnover} = \frac{\text{Annual cost of sales}}{\text{Inventory}}$$

The **Accounts receivable turnover** measures how frequently a company collects its accounts receivable in a year.

$$\text{Accounts receivable turnover} = \frac{\text{Sales}}{\text{Accounts receivable}}$$

Financial statement analysis – DuPont equation

The **DuPont equation** (or identity) expresses the ROE as:

$$\begin{aligned} \text{ROE} &= \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Sales}} \\ &= \text{Profit margin} \times \text{Asset turnover} \times \text{Equity multiplier} \end{aligned}$$

This formulation is useful for identifying the drivers of ROE, and for benchmarking.

With **benchmarking** we mean comparison with other companies in the same field, typically the leaders in that field, to identify strengths and weaknesses.