Introduction to Finance

L6

Financial Ratios: Overview

1. **Profitability Ratios (evaluate the company's ability to generate profit)**
2. **Liquidity Ratios (assess the ability of the company to meet short-term obligations)**
3. **Leverage Ratios (evaluate the company's use of debt financing- how well the company is utilizing debt- are the good loan/bad loans?)**
4. **Valuation Ratios (assess the market value of the company)**

Financial Ratios

- The most commonly used ratios for financial analysis are as follows :
    1. **Profitability ratios**
    2. Liquidity ratios
    3. Working capital ratios
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    5. Leverage ratios
    6. Valuation ratios

Profitability ratios

- From Income statement

$$\boldsymbol{Profit\ After\ Tax\ Margin} = \frac{\boldsymbol{Profit\ After\ Tax}}{\boldsymbol{Total\ Revenue}}$$

- If PAT Margin is 5% , it means that for every Rs 100 made in revenue and 95% went for expenses

Profitability ratios

- EBITDA Margin

$$\boldsymbol{EBITDA\ Margin = \frac{EBITDA}{Operating\ Revenue}}$$

$$\boldsymbol{EBITDA = \text{EBIT} + \text{Depreciation} + \text{Amortization}}$$

Or

$$\boldsymbol{EBITDA = \text{Operating Revenue} - \text{Operating Expenses}}$$

$$\boldsymbol{\text{Operating Revenue} = \text{Total Revenue} - \text{Other Income}}$$

$$\boldsymbol{\text{Operating Expense} = \text{Total expense} - \text{Finance cost} - \text{Depreciation} - \text{Amortization}}$$

- EBITDA margin tells us how profitable the company is at an operating level (in % terms)
- EBITDA margin (if x%) shows firm has kept x% of its revenue at the operation level and spend 100-x % towards its expenses

Operating Returns

- $\boldsymbol{Return\ on\ Assets(ROA) = \frac{Net\ Income + Interest\ Expense}{Book\ Value\ of\ Assets}}$
- A high ROE may indicate the firm is able to find investment opportunities that are very profitable.
- As a performance measure, **ROA has the benefit that it is less sensitive to leverage than ROE**.
- However, ROA is sensitive to working capital—for example, an equal increase in the firm's receivables and payables will increase total assets and thus lower ROA.

Operating Returns

- *Operating return ratios* helps to evaluate the firms return on investment by comparing its income to its investment
- $\boldsymbol{Return\ on\ Equity(ROE) = \frac{Net\ Income}{Book\ Value\ of\ Equity}}$ **or** $\boldsymbol{\frac{Net\ Income}{Average\ Shareholder's\ Equity}}$
- The ROE provides a measure of the return that the firm has earned on its past investments.
- **It helps us assess the return the shareholder earns for every unit of capital invested.**
- A high ROE may indicate the firm is able to find investment opportunities that are very profitable.
- **It measures the company's ability and efficiency to generate profits from the shareholder's investment**
- **Thump rule RoE greater than 15%**
- **If RoE is 10%, then it implies firm is generating net profit of Rs.10 on every Rs 100 of shareholder's equity deployed**

Operating Returns

- ***RoE drawback:***
- $\boldsymbol{Return\ on\ Equity(ROE) = \frac{Net\ Income}{Book\ Value\ of\ Equity}}$
- **Firm needs 1 lakh investment= 100% as equity**
- $\boldsymbol{Return\ on\ Equity(ROE) = \frac{10000}{1\ Lakh} = 10\%}$
- **Firm needs 1 lakh investment= 50% as equity and 50% as debt**

Operating Returns

- *ROE drawback:*
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- $\boldsymbol{Return\ on\ Equity(ROE) = \frac{10000}{1\ Lakh} = 10\%}$
- **Firm needs 1 lakh investment= 50% as equity and 50% as debt**
- $\boldsymbol{Return\ on\ Equity(ROE) = \frac{50000}{1\ Lakh} = 20\%}$
- **With additional debt, RoE increased. High RoE is better sign, but not if there is high debt. High debt results in higher interest payments**
- **Solution: DuPont Model**

The DuPont Identity

- The identity express ROE in terms of firm's profitability, asset efficiency and leverage
- ROE= Net profit margin * Return on Assets * Financial leverage
- Net profit margin Net Income/sales
- Return on Assets=Sales/ Total Assets
- Financial leverage= Total Assets/Equity

$$\text{ROE} = \underbrace{\left(\frac{\text{Net Income}}{\text{Sales}}\right)}_{\text{Net Profit Margin}} \times \underbrace{\left(\frac{\text{Sales}}{\text{Total Assets}}\right)}_{\text{Asset Turnover}} \times \underbrace{\left(\frac{\text{Total Assets}}{\text{Book Value of Equity}}\right)}_{\text{Equity Multiplier}}$$

Operating Returns

- To avoid this problem (ROA is sensitive to working capital), we can consider the firm's **return on invested capital (ROIC)**

- $\boldsymbol{Return\ on\ Invested\ Capital} = \frac{\boldsymbol{Net\ Operating\ Profit}}{\boldsymbol{Invested\ capital}}$ **or** $\frac{\boldsymbol{EBIT\ (1-tax\ rate)}}{\boldsymbol{Book\ Value\ of\ \ Equity+Net\ Debt}}$

- The return on invested capital measures the after-tax profit generated by the business itself, excluding any interest expenses (or interest income), and compares it to the capital raised from equity and debt holders that has already been deployed (i.e., is not held as cash).
- It uses the capital circulating in the business . Invested capital includes active capital and excludes non-active assets

- ROIC is significant in assessing the performance of the underlying business

Operating Returns

- Return on capital employed

- $$RoCE = \frac{EBIT}{capital\ Employed} = \frac{Net\ income + Interest + taxes}{Short\ term\ debt + long\ \ term\ debt + Equity}$$
  $$= \frac{Net\ income + Interest + taxes}{Total\ Assets - current\ liabilities}$$

- The return on capital employed indicates the company's profitability by taking into consideration the overall capital it employs
- If RoCE= 15%, it implies the firm is making EBIT of 15 by using capital of Rs.100

Financial Ratios

- The most commonly used ratios for financial analysis are as follows :
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Working Capital Ratios (WCRs)

- We can use the combined information in the firm's income statement and balance sheet to gauge how efficiently the firm is utilizing its net working capital

Working Capital Ratios

- To evaluate the speed at which a company turns sales into cash, firms often compute the number of **accounts receivable da**

$$\textbf{Accounts Receivable Days} = \frac{\boldsymbol{Accouts\ Receivable}}{\boldsymbol{Average\ Daily\ Sales}}$$

- Firm's short-term debt payment capacity is assessed by accounts payable days. The ratio compare accounts payable to cost of sale

$$\textbf{Accounts Payable Days} = \frac{\boldsymbol{Accouts\ Payable}}{\boldsymbol{Average\ Daily\ \ Cost\ of\ Sales}}$$

Working Capital Ratios (WCRs)

Example

GLOBAL CONGLOMERATE CORPORATION

Income Statement
Year Ended December 31 (in $ million)

	2022	2021
Total sales	186.7	176.1
Cost of sales	(153.4)	(147.3)
Gross Profit	33.3	28.8
Selling, general, and administrative expenses	(13.5)	(13.0)
Research and development	(8.2)	(7.6)
Depreciation and amortization	(1.2)	(1.1)
Operating Income	10.4	7.1
Other income	—	—
Earnings Before Interest and Taxes (EBIT)	10.4	7.1
Interest income (expense)	(7.7)	(4.6)
Pretax Income	2.7	2.5
Taxes	(0.7)	(0.6)
Net Income	2.0	1.9
Earnings per share:	$0.556	$0.528

GLOBAL CONGLOMERATE CORPORATION

Consolidated Balance Sheet
Year Ended December 31 (in $ million)

Assets	2022	2021	Liabilities and Stockholders' Equity	2022	2021
Current Assets			**Current Liabilities**		
Cash	21.2	19.5	Accounts payable	29.2	24.5
Accounts receivable	18.5	13.2	Notes payable/short-term debt	3.5	3.2
Inventories	15.3	14.3	Current maturities of long-term debt	13.3	12.3
Other current assets	2.0	1.0	Other current liabilities	2.0	4.0
Total current assets	57.0	48.0	Total current liabilities	48.0	44.0
Long-Term Assets			**Long-Term Liabilities**		
Land	22.2	20.7	Long-term debt	99.9	76.3
Buildings	36.5	30.5	Lease obligations	—	—
Equipment	39.7	33.2	Total debt	99.9	76.3
Less accumulated depreciation	(18.7)	(17.5)	Deferred taxes	7.6	7.4
Net property, plant, and equipment	79.7	66.9	Other long-term liabilities	—	—
Goodwill and intangible assets	20.0	20.0	Total long-term liabilities	107.5	83.7
Other long-term assets	21.0	14.0	**Total Liabilities**	**155.5**	**127.7**
Total long-term assets	120.7	100.9	**Stockholders' Equity**	**22.2**	**21.2**
Total Assets	**177.7**	**148.9**	**Total Liabilities and Stockholders' Equity**	**177.7**	**148.9**

Working Capital Ratios

- To evaluate the speed at which a company turns sales into cash, firms often compute the number of **accounts receivable da**

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- Given the example, find out A/C Receivable days for 2022

Working Capital Ratios

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$$\textbf{Accounts Receivable Days} = \frac{\boldsymbol{Accouts\ Receivable}}{\boldsymbol{Average\ Daily\ Sales}}$$

- Given **average daily sales** of \$186.7 million/365 = \$0.51 million in 2022,
- Global's **receivables** of \$18.5 million represent 18.5/0.51 = 36 days' worth of sales.
- In other words, on average, Global takes a little over one month to collect payment from its customers

Working Capital Ratios: Turnover ratios

- **Turnover ratios** are an alternative way to measure working capital. We compute turnover ratios by expressing annual revenues or costs as a multiple of the corresponding working capital account.
- $\boldsymbol{Inventory}$ **Turnover** $= \frac{\boldsymbol{Annual\ cost\ of\ Sales}}{\boldsymbol{Inventory}}$
- $\boldsymbol{Accounts\ recievable\ turnover} = \frac{\boldsymbol{Annual\ \ Sales}}{\boldsymbol{Accounts\ receivable}}$
- $\boldsymbol{Accounts\ payable\ turnover} = \frac{\boldsymbol{Annual\ cost\ of\ \ Sales}}{\boldsymbol{Accounts\ payable}}$

- **Higher turnover corresponds to shorter days implying more efficient use of working capital.**
- While working capital ratios can be meaningfully compared over time or within an industry, there are wide differences across industries

Working Capital Ratios: Turnover ratios

- Example: Global's **inventory turnover** in 2022?

Working Capital Ratios: Turnover ratios

- Example: Global's **inventory turnover** in 2022 is 153.4/ 15.3 ~10·, indicating that Global sold roughly 10 times its current stock of inventory during the year
-

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Interest Coverage Ratios

- Lenders often assess a firm's ability to meet its interest obligations by comparing its earnings with its interest expenses using an **interest coverage ratio**.
- One common ratio to consider is the **firm's EBIT as a multiple of its interest expenses**. A high ratio indicates that **the firm is earning much more than is necessary to meet its required interest payments.**

- $\boldsymbol{EBIT\ interest\ \ coverage}$ **ratio** $= \frac{\boldsymbol{EBIT}}{\boldsymbol{Interest}}$

- Depreciation and amortization expenses are deducted when computing EBIT, but they are not actually cash expenses for the firm. Consequently, financial analysts often compute a firm's earnings before interest, taxes, depreciation, and amortization, or **EBITDA**, as a measure of the cash a firm generates from its operations and has available to make interest payments

- $\boldsymbol{EBITDA\ interest\ \ coverage}$ **ratio** $= \frac{\boldsymbol{(EBIT+Depreciation+Amortization)}}{\boldsymbol{Interest}} = \frac{\boldsymbol{EBITDA}}{\boldsymbol{Interest}}$
- **EBITDA= Operating revenue-operating expenses**

Financial Ratios

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Leverage Ratios

Leverage ratios utilize information from Balance Sheet

Leverage means extent to which firm relies on debt as a source of financing

Leverage increases the risk of equity holders ,however considered as effective method of increasing returns

Leverage Ratios

- $\boldsymbol{Debt - Equity\ Ratio = \frac{Total\ Debt}{Total\ Equity}}$

  - Total Debt= Short term debt +long term Debt (including current maturities of debt)
  - We can use either book value of equity or market value of equity-more common and informative is using market value of equity to find debt-equity ratio
  - Debt to equity ratio implies how much the firm's debt is valued over its equity
  - A firm's market debt-equity ratio has important consequences for the risk and return of its stock

Leverage Ratios

- $\boldsymbol{Debt-to-Capital\ Ratio} = \frac{\boldsymbol{Total\ Debt}}{\boldsymbol{Capital}} = \frac{\boldsymbol{Total\ Debt}}{\boldsymbol{Total\ Equity + Total\ Debt}}$
  - The ratio calculate the fraction of the firm financed by debt
  - It can be computed using book or market values
- $\boldsymbol{Net\ Debt} = \boldsymbol{Total\ Debt} - (\boldsymbol{Cash}\ \&\ \boldsymbol{Shortterm\ investment})$
  - While leverage increases the risk to the firm's equity holders, firms may also hold cash reserves in order to reduce risk. Thus, another useful measure to consider is the firm's **net debt**, or debt in excess of its cash reserve
- $\boldsymbol{Debt-to-Enterprise\ Value\ \ Ratio} = \frac{\boldsymbol{Net\ Debt}}{\boldsymbol{Enterprise\ Value}} = \frac{\boldsymbol{Net\ Debt}}{\boldsymbol{Market\ Value\ of\ Equity + Net\ Debt}}$
- $\boldsymbol{Equity\ Multiplier} = \frac{\boldsymbol{Total\ Assets}}{\boldsymbol{Book\ value\ of\ equity}}$
- $\boldsymbol{Market\ ValueEquity\ Multiplier} = \frac{\boldsymbol{Enterprise\ value}}{\boldsymbol{Market\ \ value\ of\ equity}}$

(Indicates the amplification of shareholders' financial risk that results from leverage)

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Valuation Ratios

- $$PE\ ratio = \frac{Market\ Capitalisation}{Net\ Income} = \frac{Share\ Price}{Earnings\ Per\ share}$$

  - P/E ratio is the value of equity to the firm's earnings (total or per-share basis)
  - It is a simple measure that is used to assess whether a stock is over- or under-valued based on the idea that the value of a stock should be proportional to the level of earnings it can generate for its shareholders.
  - P/E ratios can vary widely across industries and tend to be highest for industries with high expected growth rates.

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Example

- Assess how Global's ability to use its assets effectively has changed in the last year by computing RoA

Example

- Assess how Global's ability to use its assets effectively has changed in the last year by computing
- 2022 : ROA= 5.5%
- 2021: ROA=4.4%

Working Capital Ratios (WCRs)

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