CH2404 Process Economics

Unit – IV

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Financial Ratios

Dr. M. Subramanian

Associate Professor
Department of Chemical Engineering
Sri Sivasubramaniya Nadar College of Engineering
Kalavakkam – 603 110, Kanchipuram (Dist)
Tamil Nadu, India
msubbu.in[AT]gmail.com

- Financial ratios are one of the tools used routinely by owners, managers, investors, and creditors to assess the financial health and performance of an enterprise. Using key ratios, you too can glean a wealth of information from your financial statements.
- A ratio, simply defined, represents the relationship between two numbers, which numbers are generally extracted directly from the financial statements. For example, if your profit for the year was $200,000 and your sales for the year were $800,000, your net profit margin would be $200,000/$800,000, or 25%
- ***No single number, or ratio for that matter, is particularly meaningful in and of itself until you compare it to something else.*** Ratios are typically compared to: (1) the same ratio over different periods of time, (2) those of other companies in the same industry, or (3) average ratios in the industry. For example, your profit margin of 25% for this year takes on a whole new perspective if your profit margin for last year was 20%, or alternatively, 30%

Introduction

- ***Financial ratios*** are useful indicators of a firm's performance and financial situation. Most ratios can be calculated from information provided by the financial statements. Financial ratios can be used to analyze trends and to compare the firm's financials to those of other firms. In some cases, ratio analysis can predict future bankruptcy.

- Financial ratios can be classified according to the information they provide. The following types of ratios are frequently used:

1. Liquidity ratios
2. Asset turnover ratios
3. Financial leverage ratios
4. Profitability ratios
5. Dividend Policy Ratios

1. Liquidity Ratios

- *Liquidity ratios* provide information about a firm's ability to meet its short-term financial obligations. They are of particular interest to those extending short-term credit to the firm.

- The frequently-used liquidity ratios are:

  - current ratio (or working capital ratio)
  - quick ratio (or acid test ratio)
  - cash ratio

Liquidity ratios

Current Ratio

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

Current assets – current liabilities = working capital

- The *current ratio (*or *working capital ratio)* indicates the firm's ability to meet or cover its current liabilities using its current assets
- Short-term creditors prefer a high current ratio since it reduces their risk. Shareholders may prefer a lower current ratio so that more of the firm's assets are working to grow the business.
- Typical values for the current ratio vary by firm and industry. For example, firms in cyclical industries may maintain a higher current ratio in order to meet financial obligations during downturns.

Liquidity ratios

Quick Ratio

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

- One drawback of the current ratio is that inventory may include many items that are difficult to liquidate quickly and that have uncertain liquidation values. The quick ratio is an alternative measure of liquidity that does not include inventory in the current assets.

- The current assets used in the quick ratio are cash, accounts receivable, and notes receivable. These assets essentially are current assets less inventory. The quick ratio often is referred to as the *acid test*.

- By leaving out the least liquid asset, the quick ratio provides a more conservative view of liquidity.

Liquidity ratios

Cash Ratio

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

- *Cash ratio* is the most conservative liquidity ratio. It excludes all current assets except the most liquid: cash and cash equivalents.

- The cash ratio is an indication of the firm's ability to pay off its current liabilities if for some reason immediate payment were demanded.

2. Asset Turnover Ratios

- Asset turnover ratios indicate of how efficiently the firm utilizes its assets. They are also known as efficiency ratios, activity ratios, asset utilization ratios, or asset management ratios.

- Two commonly used asset turnover ratios are:

  - Receivables turnover

  - Inventory turnover

Assets turnover ratios

Receivables Turnover

$$\text{Receivables Turnover} = \frac{\text{Annual Credit Sales}}{\text{Accounts Receivable}}$$

- Receivables turnover is an indication of how quickly the firm collects its accounts receivables.

- The receivables turnover is often reported in terms of the number of days that credit sales remain in accounts receivable before they are collected. This number is known as the *collection period*.

$$\text{Average collection period} = \frac{\text{Accounts Receivable}}{\text{Annual Credit Sales / 365}}$$

$$= \frac{365}{\text{Receivables Turnover}}$$

Assets turnover ratios

Inventory Turnover

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

- ***Inventory turnover*** *is a*nother major asset turnover ratio. It is the cost of goods sold in a time period divided by the average inventory level during that period.

$$\text{Inventory Period} = \frac{\text{Average Inventory}}{\text{Annual Cost of Goods Sold} / 365}$$

$$= \frac{365}{\text{Inventory Turnover}}$$

3. Financial Leverage Ratios

- A firm can finance its assets with equity or with debt. Financing with debt legally obligates the firm to pay interest and to repay the principal as promised. Equity financing does not obligate the firm to pay anything because dividends are paid at the discretion of the board of directors.

- *Financial leverage ratios* are used to assess how much financial risk the firm has taken on.

- Financial leverage ratios measure the extent to which the firm is using long term debt.

- The important ratios are:
  - Debt-to-assets ratio
  - Debt-to-equity ratio
  - Times interest earned ratio

Financial leverage ratios

Debt-to-asset ratio

- A ratio that indicates the proportion of assets financed with debt is the ***debt-to-assets ratio***, which compares total liabilities (short-term + long term debt) with total assets:

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

Financial leverage ratios

Debt-to-equity ratio

- We may also look at the financial risk in terms of the use of debt relative to the use of equity. The ***debt-to-equity ratio*** tells us how the firm finances its operations with debt relative to the shareholders' equity.

$$\text{Debt-to-Equity Ratio} = \frac{\text{Total Debt}}{\text{Total Equity}}$$

Financial leverage ratios

Times interest earned ratio

- One measure of a firm's ability to handle financial burdens is the *interest coverage ratio*, also referred to as the *times interest-covered ratio.*

- This ratio tells us how well the firm can cover or meet the interest payments associated with debt.

- This ratio also is known as the *interest coverage* and is calculated as follows:

$$\text{Interest Coverage} = \frac{\text{Earnings Before Interest and Taxes}}{\text{Interest Charges}}$$

4. Profitability Ratios

- Profitability ratios offer several different measures of the success of the firm at generating profits:
  - Gross Profit Margin
  - Return on Assets
  - Return on Equity

Profitability ratios

Gross Profit Margin

$$\text{Gross Profit Margin} = \frac{\text{Sales - Cost of Goods Sold}}{\text{Sales}}$$

- The *gross profit margin* is a measure of the gross profit earned on sales.

Profitability ratios

Return on Assets

$$\text{Return on Assets} = \frac{\text{Net Income}}{\text{Total Assets}}$$

- *Return on assets* is a measure of how effectively the firm's assets are being used to generate profits.

Profitability ratios

Return on Equity

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Shareholder Equity}}$$

- *Return on equity* is the bottom line measure for the shareholders, measuring the profits earned for each dollar invested in the firm's stock.

5. Dividend Policy Ratios

- Dividend policy ratios provide insight into the dividend policy of the firm and the prospects for future growth. Two commonly used ratios are the dividend yield and payout ratio.

$$\text{Dividend Yield} = \frac{\text{Dividends Per Share}}{\text{Share Price}}$$

- A high dividend yield does not necessarily translate into a high future rate of return. It is important to consider the prospects for continuing and increasing the dividend in the future. The dividend *payout ratio* is helpful in this regard, and is defined as follows:

$$\text{Payout Ratio} = \frac{\text{Dividends Per Share}}{\text{Earnings Per Share}}$$

Use and Limitations of Financial Ratios

Attention should be given to the following issues when using financial ratios:

- A reference point is needed. To be meaningful, most ratios must be compared to historical values of the same firm, the firm's forecasts, or ratios of similar firms.

- Most ratios by themselves are not highly meaningful. They should be viewed as indicators, with several of them combined to paint a picture of the firm's situation.

- Year-end values may not be representative. Certain account balances that are used to calculate ratios may increase or decrease at the end of the accounting period because of seasonal factors. Such changes may distort the value of the ratio. Average values should be used when they are available.

- Ratios are subject to the limitations of accounting methods. Different accounting choices may result in significantly different ratio values.

TABLE 3.14 Summary of Selected Financial Ratios

Ratio	Equation for calculation	Industry average
Liquidity		
Current	Current assets/current liabilities	1.5–2.0 times
Cash or quick cash	Current assets—inventory/current liabilities	1.0–1.5 times
Leverage		
Debt-to-total assets	Total debt/total assets	30–35%
Times interest earned	Profit before taxes plus interest charges/interest charges	7.0–8.0 times
Fixed-charge coverage	Income available for meeting fixed charges/fixed charges	5.5 times
Activity		
Inventory turnover	Sales or revenue/inventory	7.0 times
Average collection period	Receivables/sales per day	45–60 days
Fixed assets turnover	Sales/fixed assets	2–3 times
Total assets turnover	Sales/total assets	1–2 times
Profitability		
Gross profit margin	Net sales—cost of goods sold/sales (revenue)	Varies
Net operating margin	Net operating profit before taxes/sales (revenue)	Varies
Profit margin on sales	Net profit after taxes/sales (revenue)	5–8%
Return on net worth (return on equity)	Net profit after taxes/net worth	15%
Return on total assets	Net profit after taxes/total assets	10%

EXHIBIT 22.1 Fictitious Corporation Common Size Balance Sheets for Years Ending December 31

	1999		1998	
Asset Components				
Cash	3.6%		2.0%	
Marketable securities	1.8%		0.0%	
Accounts receivable	5.5%		8.0%	
Inventory	16.4%		10.0%	
Current assets		27.3%		20.0%
Net plant and equipment		63.5%		70.0%
Intangible assets		9.2%		10.0%
Total assets		100.0%		100.0%
Liability and shareholders' equity components				
Accounts payable	4.6%		4.0%	
Other current liabilities	4.6%		1.0%	
Long-term debt	36.4%		50.0%	
Total liabilities		45.4%		56.0%
Shareholders' equity		54.6%		44.0%
Total liabilities and shareholders' equity		100.0%		100.0%

Wal-Mart Stores Balance Sheet (Amount in millions)

Period Ending	Jan 31, 2002
Assets	
Current Assets	
Cash and cash equivalents	$2,161
Net receivables	2,000
Inventory	22,614
Other current assets	1,471
Total current assets	$28,246
Long-Term Assets	
Property plant and equipment	$45,750
Goodwill	8,595
Other assets	860
Total assets	$83,451

Wal-Mart Stores Balance Sheet (contd.) (Amount in millions)

Current Liabilities	
Payables and accrued expenses	$24,134
Short-term and current long term debt	3,148
Total current liabilities	$27,282
Long-Term Liabilities	
Long-term debt	$18,732
Deferred long-term liability charges	1,128
Minority interest	1,207
Total liabilities	$48,349
Stockholders Equity	
Common stock	$445
Retained earnings	34,441
Capital surplus	1,484
Other stockholder equity	(1,268)
Total stockholder equity	$35,102
Total liabilities and equity	$83,451

Wal-Mart Stores Income Statement (Amount in millions)

Period Ending:	Jan 31, 2002
Total Revenue	$219,812
Cost of Revenue	171,562
Gross Profit	$48,250
Selling General and Administrative Expenses	36,173
Earnings Before Interest and Taxes	$12,077
Interest Expense	1,326
Income Before Tax	$10,751
Income Tax Expense	3,897
Minority Interest	(183)
Net Income	$6,671

Selected Financial Ratios for Wal-Mart Stores

(Amount in millions)

Ratio	2001
Return	
Basic earning power	$12,077/$83,451 = 14.47%
Return on assets	$6,671/$83,451 = 7.9%
Return on equity	$6,671/$35,102 = 19.00%
Liquidity	
Current ratio	$28,246/$27,282 = 1.04 times
Quick ratio	$5,628 /$27,282 = 0.21 times
Profitability	
Gross profit margin	$48,250/$219,812 = 21.95%
Operating profit margin	$12,877/$219,812 = 5.86%
Net profit margin	$6,671/$219,812 = 3.03%

Selected Financial Ratios for Wal-Mart Stores (contd.)

(Amount in millions)

Activity	
Inventory turnover	$171,562/$22,618 = 7.59 times
Total asset turnover	$219,812/$83,451 = 2.63 times
Financial leverage	
Total debt-to-assets	$48,319/$83,451 = 58.90%
Total debt-to-equity	$48,319/35,102 = 1.38 times
Interest coverage	$12,077/$1,326 = 9.11 times