Ch.3 WORKING WITH FINANCIAL STATEMENTS

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Ratio Analysis

Financial ratios: Relationships determined from a firm's financial information and used for comparison purposes.

- Financial ratios are traditionally grouped into the following categories:

1. Short-term solvency, or liquidity, ratios.
2. Long-term solvency, or financial leverage, ratios.
3. Asset management, or turnover, ratios.
4. Profitability ratios.
5. Market value ratios.

❖ SHORT-TERM SOLVENCY, OR LIQUIDITY, MEASURES

- ✓ The primary concern is the firm's ability to pay its bills over the short run without undue stress.
- ✓ These ratios focus on current assets and current liabilities.

تعتبر نسب السيولة مثيرة للاهتمام بشكل خاص للدائنين على المدى القصير، لأن المديرين الماليين يعملون باستمرار مع البنوك وغيرها من المقرضين قصير الأجل.

- Current Ratio

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

Because current assets and liabilities are, in principle, converted to cash over the following 12 months, the current ratio is a measure of short-term liquidity.

Here is Prufrock's 2009 current ratio:

$$\text{Current ratio} = \frac{\$708}{\$540} = 1.31 \text{ times}$$

- ✓ Prufrock has $1.31 in current assets for every $1 in current liabilities, or we could say Prufrock has its current liabilities covered 1.31 times over.

- The Quick (or Acid-Test) Ratio

The firm may have overestimated sales and overbought or overproduced as a result. In this case, the firm may have a substantial portion of its liquidity tied up in slow-moving inventory.

For Prufrock, this ratio for 2009 was:

$$\text{Quick ratio} = \frac{\$708 - 422}{\$540} = .53 \text{ times}$$

- Other Liquidity Ratios

✓ We briefly mention three other measures of liquidity:

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

You can verify that for 2009 this works out to be .18 times for Prufrock.

Because net working capital, or NWC, is frequently viewed as the amount of short-term liquidity a firm has, we can consider the ratio of NWC to total assets:

2. $$\text{Net working capital to total assets} = \frac{\text{Net working capital}}{\text{Total assets}}$$

A relatively low value might indicate relatively low levels of liquidity. Here, this ratio works out to be ($708-540)/$3,588= 4.7%.

Imagine that Prufrock was facing a strike and cash inflows began to dry up.

How long could the business keep running?

3. $$\text{Interval measure} = \frac{\text{Current assets}}{\text{Average daily operating costs}}$$

✓ Total costs for the year, excluding depreciation and interest, were $1,344.
✓ The average daily cost was $1,344/365= $3.68 per day, The interval measure is thus $708/$3.68 = 192 days
✓ Based on this, Prufrock could hang on for six months or so.

❖ LONG-TERM SOLVENCY MEASURES

Long-term solvency ratios are intended to address the firm's long-term ability to meet its obligations, or, more generally, its financial leverage.

- **Total Debt Ratio**

$$\text{Total debt ratio} = \frac{\text{Total assets} - \text{Total equity}}{\text{Total assets}}$$
$$= \frac{\$3{,}588 - 2{,}591}{\$3{,}588} = .28 \text{ times}$$

In this case, an analyst might say that Prufrock uses 28 percent debt, Whether this is high or low or whether it even makes any difference depends on whether capital structure matters.

Prufrock has $.28 in debt for every $1 in assets, there is $.72 in equity ($1 - .28) for every $.28 in debt.

$$\text{Debt–equity ratio} = \text{Total debt}/\text{Total equity}$$
$$= \$.28/\$.72 = .39 \text{ times}$$
$$\text{Equity multiplier} = \text{Total assets}/\text{Total equity}$$
$$= \$1/\$.72 = 1.39 \text{ times}$$

$$\text{Long-term debt ratio} = \frac{\text{Long-term debt}}{\text{Long-term debt} + \text{Total equity}}$$
$$= \frac{\$457}{\$457 + 2{,}591} = \frac{\$457}{\$3{,}048} = .15 \text{ times}$$

The $3,048 in total long-term debt and equity is sometimes called the firm's total capitalization, and the financial manager will frequently focus on this quantity rather than on total assets.

- Times Interest Earned

$$\text{Times interest earned ratio} = \frac{\text{EBIT}}{\text{Interest}}$$
$$= \frac{\$691}{\$141} = 4.9 \text{ times}$$

As the name suggests, this ratio measures how well a company has its interest obligations covered, and it is often called the interest coverage ratio .

- Cash Coverage

$$\text{Cash coverage ratio} = \frac{\text{EBIT} + \text{Depreciation}}{\text{Interest}}$$
$$= \frac{\$691 + 276}{\$141} = \frac{\$967}{\$141} = 6.9 \text{ times}$$

It is a basic measure of the firm's ability to generate cash from operations, and it is frequently used as a measure of cash flow available to meet financial obligations.

❖ ASSET MANAGEMENT, OR TURNOVER, MEASURES

- ✓ The measures in this section are sometimes called asset utilization ratios.
- ✓ What they are intended to describe is how efficiently or intensively a firm uses its assets to generate sales.

• Inventory Turnover and Days' Sales in Inventory

$$\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Inventory}} = \frac{\$1{,}344}{\$422} = 3.2 \text{ times}$$

In a sense, Prufrock sold off or turned over the entire inventory 3.2 times.

As long as we are not running out of stock and thereby forgoing sales, the higher this ratio is, the more efficiently we are managing inventory.

$$\text{Days' sales in inventory} = \frac{365 \text{ days}}{\text{Inventory turnover}} = \frac{365 \text{ days}}{3.2} = 114 \text{ days}$$

This tells us that, roughly speaking, inventory sits 114 days on average before it is sold.

• Receivables Turnover and Days' Sales in Receivables

- ✓ We now look at how fast we collect on those sales.

$$\text{Receivables turnover} = \frac{\text{Sales}}{\text{Accounts receivable}} = \frac{\$2{,}311}{\$188} = 12.3 \text{ times}$$

Prufrock collected its outstanding credit accounts and reloaned the money 12.3 times during the year.

$$\text{Days' sales in receivables} = \frac{365 \text{ days}}{\text{Receivables turnover}}$$
$$= \frac{365}{12.3} = 30 \text{ days}$$

Prufrock collects on its credit sales in 30 days. For obvious reasons, this ratio is frequently called the average collection period (ACP).

- Asset Turnover Ratios

$$\text{NWC turnover} = \frac{\text{Sales}}{\text{NWC}}$$
$$= \frac{\$2,311}{\$708 - 540} = 13.8 \text{ times}$$

This ratio measures how much "work" we get out of our working capital

$$\text{Fixed asset turnover} = \frac{\text{Sales}}{\text{Net fixed assets}}$$
$$= \frac{\$2,311}{\$2,880} = .80 \text{ times}$$

With this ratio, it probably makes more sense to say that for every dollar in fixed assets, Prufrock generated $.80 in sales.

$$\text{Total asset turnover} = \frac{\text{Sales}}{\text{Total assets}}$$
$$= \frac{\$2,311}{\$3,588} = .64 \text{ times}$$

In other words, for every dollar in assets, Prufrock generated $.64 in sales.

❖ PROFITABILITY MEASURES

✓ The focus in this group is on the bottom line, net income.

- **Profit Margin**

$$\text{Profit margin} = \frac{\text{Net income}}{\text{Sales}} = \frac{\$363}{\$2{,}311} = 15.7\%$$

This tells us that Prufrock, in an accounting sense, generates a little less than 16 cents in profit for every dollar in sales.

- **Return on Assets**

✓ Is a measure of profit per dollar of assets.

$$\text{Return on assets} = \frac{\text{Net income}}{\text{Total assets}} = \frac{\$363}{\$3{,}588} = 10.12\%$$

- **Return on Equity**

Is a measure of how the stockholders fared during the year, because benefiting shareholders is our goal; ROE is, in an accounting sense, the true bottom-line measure of performance.

$$\text{Return on equity} = \frac{\text{Net income}}{\text{Total equity}} = \frac{\$363}{\$2{,}591} = 14\%$$

For every dollar in equity, therefore, Prufrock generated 14 cents in profit; but again this is correct only in accounting terms.

- The fact that ROE exceeds ROA reflects Prufrock's use of financial leverage; we will examine the relationship between these two measures in more detail next.

❖ MARKET VALUE MEASURES

✓ Our final group of measures is based, in part, on information not necessarily contained in financial statements—the market price per share of stock.

- We assume that Prufrock has 33 million shares outstanding and the stock sold for $88 per share at the end of the year, if we recall that Prufrock's net income was $363 million, we can calculate its earnings per share:

$$\text{EPS} = \frac{\text{Net income}}{\text{Shares outstanding}} = \frac{\$363}{33} = \$11$$

- Price–Earnings Ratio

The first of our market value measures, the price–earnings (PE) ratio (or multiple):

$$\text{PE ratio} = \frac{\text{Price per share}}{\text{Earnings per share}} = \frac{\$88}{\$11} = 8 \text{ times}$$

we would say that Prufrock shares sell for eight times earnings, or we might say that Prufrock shares have or "carry" a PE multiple of 8.

- Price–Sales Ratio

$$\text{Price–sales ratio} = \text{Price per share/Sales per share}$$

- Market-to-Book Ratio

✓ A second commonly quoted market value measure is the marketto-book ratio
✓ Book value per share is total equity (not just common stock) divided by the number of shares outstanding.
✓ A value less than 1 could mean that the firm has not been successful overall in creating value for its stockholders.

$$\text{Market-to-book ratio} = \frac{\text{Market value per share}}{\text{Book value per share}}$$

Ex: A firm has 160,000 shares of stock outstanding, sales of $1.94 million, net income of$126,400, a price-earnings ratio of 18.7, and a book value per share of $9.12. What is the market-to-book ratio?

أسئلة على النسب

1. Russell's Deli has cash of $136, accounts receivable of $87, accounts payable of $215, and inventory of $409. What is the value of the quick ratio?

2. Uptown Men's Wear has accounts payable of $2,214, inventory of $7,950, cash of $1,263, fixed assets of $8,400, accounts receivable of $3,907, and long-term debt of $4,200. What is the value of the net working capital to total assets ratio?

3. A firm has total assets of $311,770 and net fixed assets of $167,532. The average daily operating costs are $2,980. What is the value of the interval measure?

4. A firm has a debt-equity ratio of 0.42. What is the total debt ratio?

5. A firm has total debt of $4,620 and a debt-equity ratio of 0.57. What is the value of the total assets?

6. A firm has sales of $68,400, costs of $42,900, interest paid of $2,100, and depreciation of $6,500. The tax rate is 34 percent. What is the value of the cash coverage ratio?

6. The Bike Shop paid $2,310 in interest and $1,850 in dividends last year. The times interest earned ratio is 2.2 and the depreciation expense is $460. What is the value of the cash coverage ratio?

7. Al's Sport Store has sales of $897,400, costs of goods sold of $628,300, inventory of $208,400, and accounts receivable of $74,100. How many days, on average, does it take the firm to sell its inventory assuming that all sales are on credit?

8. The Flower Shoppe has accounts receivable of $3,709, inventory of $4,407, sales of $218,640, and cost of goods sold of $167,306. How many days does it take the firm to both sell its inventory and collect the payment on the sale assuming that all sales are on credit?

9. A firm has net working capital of $2,715, net fixed assets of $22,407, sales of $31,350, and current liabilities of $3,908. How many dollars worth of sales are generated from every $1 in total assets?

10. The Meat Market has $747,000 in sales. The profit margin is 4.1 percent and the firm has 7,500 shares of stock outstanding. The market price per share is $27. What is the price-earnings ratio?

11. Big Guy Subs has net income of $150,980, a price-earnings ratio of 12.8, and earnings per share of $0.87. How many shares of stock are outstanding?

12. A firm has annual sales of $320,000, a price-earnings ratio of 24, and a profit margin of 4.2 percent. There are 14,000 shares of stock outstanding. What is the price-sales ratio?

13. Lassiter Industries has annual sales of $220,000 with 10,000 shares of stock outstanding. The firm has a profit margin of 7.5 percent and a price-sales ratio of 1.20. What is the firm's price-earnings ratio?

	2008	2009
Assets		
Current assets		
Cash	$ 84	$ 98
Accounts receivable	165	188
Inventory	393	422
Total	$ 642	$ 708
Fixed assets		
Net plant and equipment	$2,731	$2,880
Total assets	$3,373	$3,588
Liabilities and Owners' Equity		
Current liabilities		
Accounts payable	$ 312	$ 344
Notes payable	231	196
Total	$ 543	$ 540
Long-term debt	$ 531	$ 457
Owners' equity		
Common stock and paid-in surplus	$ 500	$ 550
Retained earnings	1,799	2,041
Total	$2,299	$2,591
Total liabilities and owners' equity	$3,373	$3,588

Sales		$2,311
Cost of goods sold		1,344
Depreciation		276
Earnings before interest and taxes		$ 691
Interest paid		141
Taxable income		$ 550
Taxes (34%)		187
Net income		$ 363
Dividends	$121	
Addition to retained earnings	242	

SOURCES AND USES OF CASH

✓ Sources of cash a firm's activities that generate cash.

Sources of cash:
- Increase in accounts payable
- Increase in common stock
- Increase in retained earnings

✓ uses of cash A firm's activities in which cash is spent, also called applications of cash

Uses of cash:
- Increase in accounts receivable
- Increase in inventory
- Decrease in notes payable
- Decrease in long-term debt
- Net fixed asset acquisitions

Standardized Financial Statements

To start making comparisons, one obvious thing we might try to do is to somehow standardize the financial statements.

One common and useful way of doing this is to work with percentages instead of total dollars.

COMMON-SIZE STATEMENTS

A standardized financial statement presenting all items in percentage terms.

✓ Balance sheet items are shown as a percentage of assets.
✓ Income statement items as a percentage of sales.

- **common–base year: statement A standardized financial statement presenting all items relative to a certain base year amount**

❖ The Du Pont Identity

We illustrate the relationship between these measures in this section by investigating a famous way of decomposing ROE into its component parts.

✓ **To begin, let's recall the definition of ROE:**

$$\text{ROE} = \text{Profit margin} \times \text{Total asset turnover} \times \text{Equity multiplier}$$

Du Pont identity popular expression breaking ROE into three parts:

Operating efficiency, asset use efficiency, and financial leverage.

- Examples

1. X com. has sales of $807,200, total assets of $1,105,100, and a profit margin of 9.68 percent. The firm has a total debt ratio of 78 percent. What is the return on equity?

2. X com. has a profit margin of 5.6 percent, a return on assets of 12.5 percent, and an equity multiplier of 1.49. What is the return on equity?

3. X com. has a profit margin of 6.80 percent, total asset turnover of 1.95, and ROE of 18.27 percent. What is this firm's debt–equity ratio?

4. Organic Chicken Company has a debt–equity ratio of .65. Return on assets is 8.5 percent, and total equity is $540,000. What is the equity multiplier? Return on equity? Net income?

5. Based only on the following information for Bennington Corp., did cash go up or down? By how much? Classify each event as a source or use of cash.

Decrease in inventory	$375
Decrease in accounts payable	190
Increase in notes payable	210
Increase in accounts receivable	105