

FIN 3000

Chapter 4



Financial Analysis

Liuren Wu

Overview

1. Why Do We Analyze Financial Statements
2. Common Size Statements – Standardizing Financial Information
3. Using Financial Ratios
4. Selecting a Performance Benchmark
5. The Limitations of Ratio Analysis

Principles Used in this Chapter

- ❑ Principle 1: Money has a Time Value.
 - ❑ Financial statements typically ignore time value of money. Thus, financial managers and accountants may view financial statements very differently.
- ❑ Principle 2: There Is a Risk-Return Tradeoff.
 - ❑ Financial statement analysis can yield important information about the strengths and weaknesses of a firm's financial condition. The analysts can use such information to infer the risk-return tradeoff in a firm.
- ❑ Principle 3: Cash Flows Are the Source of Value.
 - ❑ An important use of a firm's financial statements involves analyzing past performance as a tool for predicting future cash flows.
- ❑ Principle 4: Market Prices Reflect Information.
 - ❑ Financial statement analysis requires gathering information about a firm's financial condition, which is important to the valuation of the firm.

Why Analyze Financial Statements?

- ❑ An internal financial analysis might be done:
 - ❑ To evaluate the performance of employees and determine their pay raises and bonuses.
 - ❑ To compare the financial performance of the firm's different divisions.
 - ❑ To prepare financial projections, such as those associated with the launch of a new product.
 - ❑ To evaluate the firm's financial performance in light of its competitors and determine how the firm might improve its operations.

- ❑ A variety of firms and individuals that have an economic interest might also undertake an external financial analysis:
 - ❑ *Banks and other lenders* deciding whether to loan money to the firm.
 - ❑ *Suppliers* who are considering whether to grant credit to the firm.
 - ❑ *Credit-rating agencies* trying to determine the firm's creditworthiness.
 - ❑ *Professional analysts* who work for investment companies considering investing in the firm or advising others about investing.
 - ❑ *Individual investors* deciding whether to invest in the firm.

Common Size Statements

- ❑ **A common size financial statement** is a standardized version of a financial statement in which all entries are presented in percentages.
- ❑ A common size financial statement helps to compare entries in a firm's financial statements, even if the firms are not of equal size.
- ❑ How to prepare a common size financial statement?
 - ❑ For a common size income statement, divide each entry in the income statement by the company's sales.
 - ❑ For a common size balance sheet, divide each entry in the balance sheet by the firm's total assets.

Table 4.1**H. J. Boswell, Inc.**

Common Size Income Statement for the Year Ending December 31, 2010

Sales		100.0%
Cost of goods sold		-75.0%
Gross profits		25.0%
Operating expenses:		
Selling expenses	-3.3%	
General and administrative expense	-2.5%	
Depreciation and amortization expense	-5.0%	
Total operating expense		-10.8%
Operating income (EBIT or earnings before interest and taxes)		14.2%
Interest expense		-2.5%
Earnings before taxes		11.7%
Income taxes		-4.1%
Net income		7.6%

Table 4.2

H. J. Boswell, Inc.

	2009	2010	Change
Cash	5.4%	4.6%	-0.8%
Accounts receivable	7.9%	8.2%	0.3%
Inventory	13.0%	19.2%	6.2%
Other current assets	0.8%	0.7%	-0.1%
Total current assets	27.0%	32.6%	5.6%
Gross plant and equipment	94.6%	93.6%	-1.0%
Less accumulated depreciation	-21.7%	-26.3%	-4.6%
Net plant and equipment	73.0%	67.4%	-5.6%
Total assets	100.0%	100.0%	0.0%
	2009	2010	Change
Accounts payable	10.5%	9.6%	-0.9%
Accrued expenses	2.6%	2.3%	-0.3%
Short-term notes	3.6%	2.7%	-0.8%
Total current liabilities	16.6%	14.6%	-2.0%
Long-term debt	40.8%	39.2%	-1.7%
Total debt	57.4%	53.8%	-3.6%
Common stockholders' equity			
Common stock—par value	2.6%	2.3%	-0.3%
Paid in capital	18.4%	16.4%	-1.9%
Retained earnings	21.7%	27.5%	5.8%
Total common stockholders' equity	42.6%	46.2%	3.6%
Total liabilities and equity	100.0%	100.0%	0.0%

Using Financial Ratios

- ❑ **Financial ratios** provide a second method for standardizing the financial information on the income statement and balance sheet.
- ❑ A ratio by itself may have no meaning. Hence, a given ratio is compared to:
 - a) ratios from previous years – time series analysis; or
 - b) ratios of other firms in the same industry – cross-sectional analysis.
- ❑ If the differences in the ratios are significant, more in-depth analysis must be done.

Financial Ratios

Question	Category of Ratios Used
1. How liquid is the firm? Will it be able to pay its bills as they become due?	Liquidity ratios
2. How has the firm financed the purchase of its assets?	Capital structure ratios
3. How efficient has the firm's management been in utilizing its assets to generate sales?	Asset management efficiency ratios
4. Has the firm earned adequate returns on its investments?	Profitability ratios
5. Are the firm's managers creating value for shareholders?	Market value ratios

I. Liquidity Ratios

- A firm is financially liquid if it is able to pay its bills on time. We can analyze a firm's liquidity from two perspectives:
 - ① Overall or general firm liquidity: Comparing the firm's current assets to the firm's current liabilities, e.g., [1] **current ratio**, [2] **quick ratio**.
 - ② Liquidity of specific current asset accounts: Examining how timely the firm's primary liquid assets – accounts receivable and inventories – are converted into cash, e.g., [3] **average collection period on accounts receivable**, [4] **accounts receivable turnover ratio**, [5] **inventory turnover ratio**, [6] **days' sales in inventory**

- These ratios can all be computed from information on the balance sheet and the income statement

[1] Current Ratio

- **Current Ratio:** compares a firm's current (liquid) assets to its current (short-term) liabilities.

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

- Example: H.J. Boswell, Inc.
 - 2009: \$477.0/\$292.5=**1.63 times**
 - 2010: \$643.5/\$288.0=**2.23 times**
 - The firm had \$1.63 in current assets for every \$1 it owed in current liability. The current ratio *improved* in 2010 to 2.23 times as the current assets increased significantly in 2010.

[2] Quick Ratio

- The overall liquidity of a firm is also analyzed by computing the **Acid-Test (Quick) Ratio**. This ratio excludes the inventory from current assets as inventory may not always be very liquid.

$$\text{Acid-Test (or Quick) Ratio} = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}$$

- Example: H.J. Boswell, Inc.
 - 2009: $\$(477.0 - 229.5) / \$292.5 = \mathbf{0.85}$
 - 2010: $\$(643.5 - 378.0) / \$288.0 = \mathbf{0.92}$
 - The firm is clearly less liquid using quick ratio as the firm has only \$0.85 in current assets (less inventory) to cover \$1 in current liabilities. The quick ratio *improved* in 2010 to 0.92 times largely due to an increase in current assets.

[3] **Average Collection Period** on Accounts Receivables

- **Average Collection Period** measures the number of days it takes the firm to collect its accounts receivables.

$$\text{Average Collection Period} = \frac{\text{Accounts Receivable}}{\text{Annual Credit Sales}/365 \text{ days}} = \frac{\text{Accounts Receivable}}{\text{Daily Credit Sales}}$$

- Example: H.J. Boswell, Inc., assuming annual credit sales of \$2,500 million in 2009 and \$2,700 million in 2010.
 - Daily credit sales for 2009: $\$2500/365 = \mathbf{\$6.85 \text{ million}}$.
 - Daily credit sales for 2010: $\$2700/365 = \mathbf{\$7.40 \text{ million}}$.
 - 2009: $\$139.50/\$6.85 = \mathbf{20.37}$
 - 2010: $\$162.00/\$7.40 = \mathbf{21.90}$
 - The firm collects its accounts receivable in about 20.37 days in 2009 and 21.90 days in 2010 (slower).

[4] Accounts Receivable Turnover Ratio

- **Accounts Receivable Turnover Ratio** measures how many times accounts receivable are “rolled over” during a year.

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

- Example: H.J. Boswell, Inc., assuming annual credit sales of \$2,500 million in 2009 and \$2,700 in 2010.
 - 2009: $\$2500/\$139.50 = \mathbf{17.92}$
 - 2010: $\$2700/\$162.00 = \mathbf{16.67}$
 - The firm’s accounts receivable turns over 17.92 times a year in 2009 and 16.67 times a year in 2010 (slower).

[5] Inventory Turnover Ratio

- + **Inventory turnover ratio** measures how many times the company turns over its inventory during the year. Shorter inventory cycles lead to greater liquidity since the items in inventory are converted to cash more quickly.

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

- Example: H.J. Boswell, Inc., assuming costs of goods sold in 2009=\$1,980 million.
 - 2009: \$1980/\$229.5=8.63
 - 2010: \$2025/\$378.00 =5.36
 - The firm's inventory turns over 8.63 times a year in 2009 and 5.36 times a year in 2010 (slower).

[6] Days' Sales in Inventory

- We can also express the inventory turnover ratio in terms of the number of days the inventory sits unsold on the firm's shelves.

$$\begin{aligned}\text{Days' Sales in Inventory} &= \text{Inventory}/(\text{Costs of Goods Sold}/365) \\ &= 365/\text{Inventory turnover ratio}\end{aligned}$$

- Example: H.J. Boswell, Inc.,
 - 2009: $365/8.63=42.31$ days
 - 2010: $365/5.36 =68.13$ days
 - The firm on averages holds the goods in the inventory for 42 days in 2009 and 68 days in 2010.

Can a Firm Have Too Much Liquidity?

- ❑ A high investment in liquid assets will enable the firm to repay its current liabilities in a timely manner.
- ❑ However, an excessive investments in liquid assets can prove to be costly as liquid assets (such as cash) generate minimal return.

Checkpoint 4.1

Evaluating Dell Computer Corporation's (DELL) Liquidity

You work for a small company that manufactures a new memory storage device. Computer giant Dell has offered to put the new device in their laptops if your firm will extend them credit terms that allow them 90 days to pay. Since your company does not have many cash resources, your boss has asked that you look into Dell's liquidity and analyze its ability to pay their bills on time using the following accounting information for Dell and two other computer firms (figures in thousands of dollars):

Checkpoint 4.1

	Dell 2009	Apple 2009	HP 2009
Current assets	\$24,245,000	\$31,555,000	\$52,539,000
Accounts receivable	8,543,000	5,057,000	25,301,000
Cash	10,635,000	23,464,000	13,334,000
Inventories	1,051,000	455,000	6,128,000
Other current assets	3,643,000	2,579,000	7,776,000
Sales	61,101,000	42,905,000	91,658,000
Cost of goods sold	50,144,000	25,683,000	69,178,000
Total current liabilities	14,859,000	11,506,000	35,850,000

- Compute and compare the current ratio, quick ratio, accounts receivable turnover ratio and inventory turnover ratio.
 - Average collection period on accounts receivable and days' sales in inventory are simply inverse of the corresponding turnover ratios (multiplied by 365 to convert fraction of a year into number of days)

Checkpoint 4.1

	Dell 2009	Apple 2009	HP 2009	Peer Group Average
Current ratio = current assets / current liabilities	1.63	2.04	1.47	1.75
Acid-test ratio = (current assets – inventories) / current liabilities	1.56	2.00	1.29	1.65
Accounts receivable turnover = sales / accounts receivable	7.15	8.48	3.62	6.05
Inventory turnover = cost of goods sold / inventory	47.71	56.45	11.29	33.87

STEP 4: Analyze

Based on all four liquidity ratios, Dell looks very similar to both Apple and HP. In fact, Dell's liquidity ratios place it below Apple and above HP in each ratio. For example, Dell turns over its accounts receivable 7.15 times per year which is somewhat lower than the 8.48 times for Apple but substantially higher than the 3.62 times for HP. Furthermore, both Dell and Apple manage their inventories more efficiently than HP as indicated in Dell's inventory turnover of 47.71 and Apple's 56.45 compare to only 11.29 for HP.

Earlier we said that analysts use ratios the same way a detective uses clues. So what would we find if we looked closer? First, we would find that Dell uses a just-in-time inventory system designed to keep inventories as low as possible by producing only what is needed, when it is needed. In addition, Dell's computers are "built-to-order", that is, they are only assembled once they are ordered. Dell's suppliers make multiple shipments to Dell daily, supplying Dell with the parts it needs when, and only when, it requires them. In effect, Dell's suppliers, rather than Dell, hold Dell's inventory. As a result, Dell maintains a very small inventory, resulting in a high inventory turnover ratio than HP but slightly less than Apple.

Checkpoint 4.1: *Check Yourself*

Calculate HP's inventory turnover ratio and days' sales in inventory. Why do you think this ratio is so much lower than Dell's inventory turnover ratio?

Analysis

- ❑ In 2009, the inventory turnover ratio is 11.29 for HP, much slower compared to 47.71 for Dell.
- ❑ Days's sales in inventory is $(365/11.29)=32.33$ days for HP while only $(365/47.71)=7.65$ days for Dell.
- ❑ There are two reasons why HP has a lower turnover of inventories relative to Dell:
 - ❑ HP sells computers out of inventory of computers while Dell builds computers only when orders are received.
 - ❑ HP carries more parts inventory on hand than does Dell.

II. Capital Structure Ratios

- ❑ **Capital structure** refers to the way a firm finances its assets.
- ❑ Capital structure ratios address the important question: How has the firm financed the purchase of its assets?
- ❑ We will use two ratios, [1] **debt ratio** and [2] **times interest earned ratio**, to answer the question.

[1] Debt Ratio

- **Debt ratio** measures the proportion of the firm's assets that are financed by borrowing or debt financing.

$$\text{Debt Ratio} = \frac{\text{Total Liabilities}}{\text{Total Assets}}$$

- Example: H.J. Boswell, Inc.,
 - 2009: $\$1012.50/\$1764.00 = 57.40\%$
 - 2010: $\$1059.75/\$1971.00 = 53.77\%$
 - The firm financed 57.40% of its assets with debt in 2009; 53.77% in 2010.
 - The debt ratios can be directly read from the total liabilities in the common size statement.

[2] Times Interest Earned Ratio

□ Times Interest Earned Ratio (interest coverage ratio)

measures the ability of the firm to service its debt or repay the interest on debt.

$$\text{Times Interest Earned} = \frac{\text{Operating Income or EBIT}}{\text{Interest Expense}}$$

□ Example: H.J. Boswell, Inc.,

➤ 2010: $\$382.50/\$67.50 = 5.67$ times

➤ The firm can pay its total interest expense 5.67 times or interest consumed $1/5.67^{\text{th}}$ or 17.65% of its EBIT. Thus, even if the EBIT shrinks by 82.35% (100-17.65), the firm will still be able to pay its interest expense.

Checkpoint 4.2

Comparing the Financing Decisions of Home Depot (HD) and Lowes Corporation (LOW)

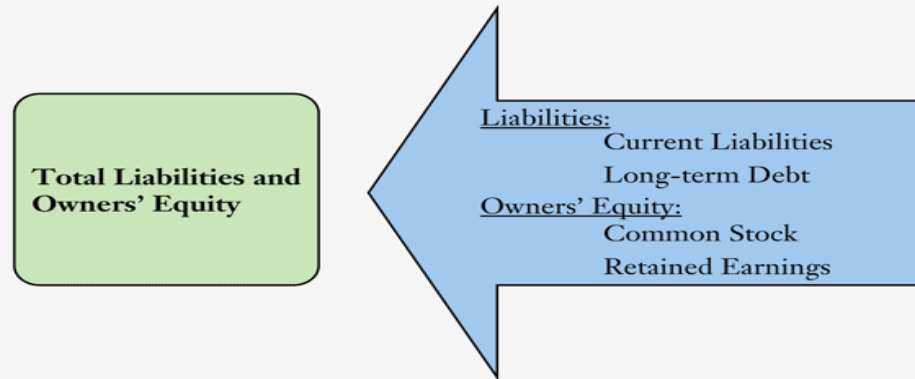
You inherited a small sum of money from your grandparents and currently have it in a savings account at your local bank. After enrolling in your first finance class in business school you have decided that you would like to begin investing your money in the common stock of a few companies. The first investment you are considering is stock in either Home Depot or Lowes. Both firms operate chains of home improvement stores throughout the United States and other parts of the world.

In your finance class you learned that an important determinant of the risk of investing in a firm's stock is driven by the firm's capital structure, or how it has financed its assets. In particular, the more money the firm borrows, the greater is the risk that the firm may become insolvent and bankrupt. Consequently, the first thing you want to do before investing in either company's stock is to compare how they financed their investments. Just how much debt financing have the two firms used?

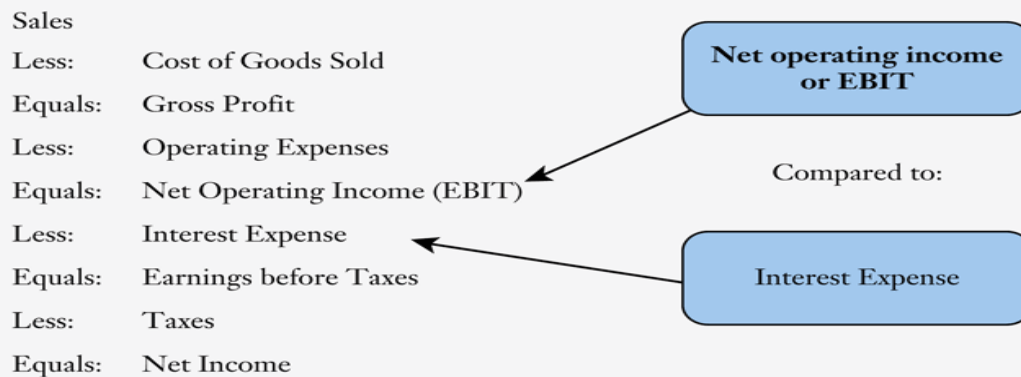
STEP 1: Picture the problem

The use of debt financing has two important dimensions that can be stated as questions: "How much debt has the firm used?" and "Can the firm afford to pay the interest on its debt?"

We can visualize the basis for answering the first question by looking at the relative importance of the components of the right-hand side of the firm's balance sheet, i.e.,



The second question we ask with respect to the use of debt financing can be addressed by looking at the firm's income statement. In this instance we are interested in comparing the amount of net operating income (or Earnings Before Interest and Taxes or EBIT) the firm earned with the amount of interest expense the firm owes on its debt financing. So, envision the income statement as follows:



STEP 2: **Decide** on a solution strategy

Our strategy for addressing this problem is to act like a financial detective. Here the question centers on determining how Home Depot and Lowes have chosen to finance their assets, and the clues you are going to use to solve it are ratios. Specifically, we will be using the debt ratio calculated from information contained in the firms' balance sheets, and the times interest earned ratio, which is calculated using information contained in the firms' income statements.

STEP 3: **Solve**

Using the following financial information from the Home Depot and Lowes 2007 annual reports, the debt ratio and times interest earned ratio can be easily calculated (the figures below are in thousands of dollars).

	Home Depot 2007	Lowes 2007
Total debt	\$27,233,000	\$12,042,000
Total common equity	25,030,000	15,725,000
Total assets	52,263,000	27,767,000
Operating income	9,673,000	5,152,000
Interest expense	392,000	154,000

As you can see from the calculations below, in 2007 Home Depot's debt ratio exceeds that of Lowes by almost 10%, and its times interest earned ratio is lower than that of Lowes.

	Home Depot 2007	Lowes 2007
Debt ratio	52.11%	43.37%
Times interest earned	24.68	33.45

STEP 4: Analyze

Home Depot's debt ratio exceeds that of Lowes by almost 10%. From this we can conclude that Home Depot has used more debt financing than Lowes. Later when we evaluate firm profitability we will evaluate whether this use of debt financing has been beneficial or not. The key concern here is whether Home Depot is able to consistently earn a higher rate of return on its investments than it must pay to its creditors. For example, if you borrow money and pay 7% interest and then invest the money to earn 10%, you will get to keep the 3% difference. In this case debt financing is beneficial. If, on the other hand, you earn only 5%, then you will have to make up the 2% shortfall and debt financing is destructive.

Checkpoint 4.2: Check Yourself

What would be Home Depot's times interest earned ratio if interest payments remained the same, but net operating income dropped by 80% to only \$1.9346 billion? Similarly if Lowes' net operating income dropped by 80%, what would its times interest earned ratio be?

Solution: Times Interest Earned (TIE) = EBIT \div Interest Expense

$$\begin{aligned} \text{➤ TIE (Home Depot)} &= [\$9.637 * (1 - 80\%) \text{ billion}] / \$0.392 \text{ billion} \\ &= \$1.9346 \div \$0.392 = \mathbf{4.94 \text{ times}} \end{aligned}$$

$$\begin{aligned} \text{➤ TIE (Lowes)} &= [\$5.52 * (1 - 80\%) \text{ billion}] / \$0.154 \text{ billion} \\ &= \$1.03 \text{ billion} \div \$0.154 \text{ billion} = \mathbf{6.69 \text{ times}} \end{aligned}$$

III. Asset Management Efficiency Ratios

- ❑ **Asset management efficiency ratios** measure a firm's effectiveness in utilizing its assets to generate sales.
- ❑ They are commonly referred to as **turnover ratios** as they reflect the number of times a particular asset account balance turns over during a year.

Asset Management Efficiency Ratios

- ① **Total Asset Turnover Ratio** represents the amount of sales generated per dollar invested in firm's assets.

$$\text{Total Asset Turnover} = \frac{\text{Sales}}{\text{Total Assets}} = \frac{\$2,700 \text{ million}}{\$1,971 \text{ million}} = 1.37 \text{ times}$$

Peer group total asset turnover = 1.15 times

- ② **Fixed asset turnover ratio** measures firm's efficiency in utilizing its fixed assets (such as property, plant and equipment).

$$\text{Fixed Asset Turnover} = \frac{\text{Sales}}{\text{Net Plant and Equipment}} = \frac{\$2,700 \text{ million}}{\$1,327.5 \text{ million}} = 2.03 \text{ times}$$

Peer group fixed asset turnover = 1.75 times

Asset Management Efficiency Ratios

- ❑ We could similarly compute the turnover ratio for other assets.
- ❑ We had earlier computed, similarly, the receivables turnover against credit sales and inventory turnover against costs of goods sold, which measure firm effectiveness in managing its investments in accounts receivables and inventories.

Asset Management Efficiency Ratios for Boswell, Inc.

- The following grid summarizes the efficiency of Boswell's management in utilizing its assets to generate sales in 2010.

Turnover Ratio	Boswell	Peer Group	Assessment
Total Assets	1.37	1.15	Good
Fixed Assets	2.03	1.75	Good
Receivables	16.67	14.60	Good
Inventory	5.36	7.0	Poor

IV. Profitability Ratios

- ❑ **Profitability ratios** address a very fundamental question: Has the firm earned adequate returns on its investments?
- ❑ We answer this question by analyzing the firm's **profit margin**, which predict the ability of the firm to control its expenses, and the firm's **rate of return on investments**.
- ❑ Two fundamental determinants of firm's profitability and returns on investments are the following:
 - ❑ Cost Control
 - ❑ Is the firm controlling costs and earning reasonable profit margin?
 - ❑ Efficiency of asset utilization
 - ❑ Is the firm efficiently utilizing the assets to generate sales?

[i] Profit margins

- ① **Gross profit margin** = Gross profits/Sales. It shows how well the firm's management controls its expenses to generate profits.
 - ② **Operating profit margin** = Operating income (EBIT)/Sales. It measures how much profit is generated from each dollar of sales after accounting for both costs of goods sold and operating expenses. It thus also indicates how well the firm is managing its income statement.
 - ③ **Net profit margin** = Net income/Sales. It measures how much income is generated from each dollar of sales after adjusting for all expenses (including income taxes).
- They can be directly read from the common size income statement as gross profit, EBIT, and net income.
 - For Bosewell, they are 25%, 14.17%, and 7.58%, respectively.

[ii] Returns on investments

- ① **Operating Return on Assets = EBIT/Total Assets.** It is the summary measure of operating profitability, which takes into account both the management's success in controlling expenses, contributing to profit margins, and its efficient use of assets to generate sales.
- A combination of **operating profit margin** and **total asset turnover**. $[(EBIT/Sales) \times (Sales/Total\ Assets)]$
 - Bosewell 2010:
 - Operating return on assets = $\$382.50/\$1971.00 = 19.41\%$.
 - Operating profit margin = $\$382.50/\$2700 = 14.17\%$.
 - Total asset turnover = $\$2700/\$1971 = 1.37$.
 - Operating return on assets also = $14.17\% \times 1.37 = 19.41\%$.

Return on the Owner's Investment

- ② **Return on Equity (ROE)** ratio measures the accounting return on the common stockholders' investment,

$$\text{Return on equity} = \text{Net income} / \text{Common equity}$$

- Bosewell 2010 Return on equity = $\$204.75 / \$911.25 = 22.47\%$.
- Note common equity includes both common stock plus the firm's retained earnings.

Using the DuPont Method for Decomposing the ROE ratio

- ❑ **DuPont method** analyzes the firm's ROE by decomposing it into three parts: profitability, efficiency and an equity multiplier.
 - ❑ $ROE = \text{Profitability} \times \text{Efficiency} \times \text{Equity Multiplier}$
= (Net Profit margin) x (Total Asset Turnover) x (Equity Multiplier)
 - ❑ **Equity multiplier** = (Total Assets/Total Equity) = $1/(1 - \text{Debt ratio})$, captures the effect of the firm's use of debt financing on its return on equity. The equity multiplier increases in value as the firm uses more debt.

Decomposing Boswell's ROE

- The following table shows why Boswell's return on equity was higher than its peers.

	Return on Equity	Net Profit Margin	Total Asset Turnover	Equity Multiplier
H. J. Boswell, Inc.	22.5%	7.6%	1.37	2.16
Peer Group	18.0%	10.2%	1.15	1.54

- The table suggests that Boswell had a higher ROE as it was able to generate more sales from its assets (1.37 versus 1.15 for peers) and used more leverage (2.16 versus 1.54).

Checkpoint 4.3

Evaluating the Operating Return on Assets Ratio for Home Depot (HD) and Lowes (LOW)

In Checkpoint 4.2 we evaluated how much debt financing Home Depot and Lowes used. We continue our analysis by evaluating the operating return on assets (OROA) earned by the two firms. Calculate the net operating income each firm earned during 2007 relative to the total assets of each firm using the information :

	Home Depot 2007	Lowes 2007
Accounts receivable	\$ 3,323,000	\$ 161,000
Inventories	12,822,000	7,144,000
Sales	90,837,000	46,927,000
Operating profits	9,673,000	5,152,000
Cost of goods sold	61,054,000	30,729,000
Net fixed assets	30,744,000	19,453,000
Total assets	52,263,000	27,767,000

STEP 3: Solve

Using the following financial information from the 2007 annual reports of Home Depot and Lowes, we first calculate the operating return on assets for Home Depot and Lowes to be 18.51% and 18.55%, respectively. So, we can make a very important observation right away that the two firms earn very similar returns on their total assets. Our objective from this point forward then is not so much to explore the source of this very small difference, but to look for anything that is unusual and that we might want to explore further.

Next, we break down the operating return on assets ratio into the product of the operating profit margin (OPM) and the total asset turnover ratio (TATO). We learn that the firms share very similar operating profit margins of 10.65% and 10.98% with the slight edge going to Lowes. However, Lowes' total asset turnover ratio is slightly lower than Home Depot. The similarity in operating return on assets for the two firms also characterizes the two determinants of this ratio. These firms look very much alike in terms of their operating performance.

	Home Depot 2007	Lowes 2007
Operating return on assets (OROA)	18.51%	18.55%
Operating profit margin (OPM)	10.65%	10.98%
Total asset turnover (TATO)	1.74	1.69
Accounts receivable turnover	27.34	291.47
Inventory turnover	4.76	4.30
Fixed assets turnover	2.95	2.41

From there, we can look closer at the total asset turnover ratio and determine the turnover ratios for the major asset subcategories that make up total assets—receivables, inventories, and fixed assets. In this analysis we are struck by the dramatic difference in the accounts receivable turnover ratios of the two firms. Home Depot turns its accounts receivable over every 27.34 days or about once a month (12 times a year). Lowes, in contrast, turns its receivables over 291.47 times a year. Why this dramatic difference? Looking at the determinants of these two ratios we see that Lowes has a very low accounts receivable balance compared to Home Depot. It would appear that the two firms follow very different policies with respect to offering credit.

Checkpoint 4.3

STEP 4: Analyze

The two firms earn almost identical operating returns on their asset investments (i.e., OROA), which reflect near identical operating profit margins and total asset turnover ratios. The only real difference we observe relates to the accounts receivable turnover ratio, which is dramatically lower for Home Depot than for Lowes. Even so, receivables are such a modest investment for both firms that the difference in turnover does not have much impact on either firm's total asset turnover ratios. In fact, Home Depot's slightly higher inventory and fixed asset turnover ratios more than offset the effect of the dramatically lower accounts receivable turnover ratio.

Checkpoint 4.3: *Check Yourself*

If Home Depot were able to raise its total asset turnover ratio to 2.5 while maintaining its current operating profit margin, what would happen to its operating return on assets?

Solution

- The operating return on assets ratio for a firm is determined by two factors: cost control and efficiency of asset utilization. It is expressed by equation 4-13a. Here the focus is on asset utilization i.e. improvement in total asset turnover ratio.
- Operating Return on Assets (OROA)
= Total Asset Turnover × Operating Profit Margin
- ❖ Before = $1.74 \times 10.65\% = 18.53\%$
- ❖ Now = $2.5 \times 10.65\% = 26.63\%$
- An improvement in total asset turnover ratio has a favorable impact on Home Depot's operating return on assets (OROA).
- If Home Depot wants to increase its OROA more, it should focus on cost control that will help improve the net operating profit.

V. Market Value Ratios

- **Market value ratios** address the question, how are the firm's shares valued in the stock market?
 - ① **Price-Earnings Ratio (PE ratio)**=Market price per share/earnings per share, indicates how much investors are currently willing to pay for \$1 of reported earnings.
 - ② **Market-to-Book Ratio**=Market price per share/book value per share, measures the relation between the market value and the accumulated investment in the firm's equity.

Examples: Bosewell PE ratios

+ Bosewell 2010:

$$\text{Price Earnings Ratio} = \frac{\text{Market Price per Share}}{\text{Earnings per Share}}$$

$$\text{Price Earnings Ratio} = \frac{\$32.00}{\$2.28} = 14.07 \text{ times}$$

Peer group average price-earnings ratio = 12.0 times

- What will be the PE ratio for 2009 if we assume the firm's stock was selling for \$22 per share at a time when the firm reported a net income of \$217.75 million, and the total number of common shares outstanding are 90 million?
 - Earnings per share (EPS) = \$217.75 million \div 90 million = \$2.42
 - PE ratio = \$22 \div \$2.42 = **9.09**
 - The investors were willing to pay \$9.09 for every dollar of earnings per share that the firm generated.

Bosewell market-to-book ratios

2010: Market-to-Book-Ratio = $\frac{\text{Market Price per Share}}{\text{Book Value per Share}} = \frac{\text{Market Price per Share}}{\text{Common Shareholders' Equity} / \text{Common Shares Outstanding}}$

Market-to-Book-Ratio = $\frac{\$32.00}{\$911.25 \text{ million} / 90 \text{ million}} = \frac{\$32.00}{\$10.13} = 3.16$

Peer firm market-to-book ratio = 2.7X

- What will be the market-to-book ratio for 2009 given that the current market price of the stock is \$22 and the firm has 90 million shares outstanding?
 - Book Value per Share = 751.50 million ÷ 90 million = \$8.35 per share
 - Market-to-Book Ratio = \$22 ÷ \$8.35 = **2.63 times**

Checkpoint 4.4

Comparing the Valuation of Dell (DELL) to Apple (APPL) Using Market Value Ratios

Financial Statement as of (millions of dollars except per share figures)	1/21/2010 Dell	9/26/2009 Apple
Net income	\$1,433	\$ 8,235
Shares outstanding (millions)	1,962	907
Earnings per share	\$ 0.73	\$ 9.08
Price per share (4/9/10)	\$15.56	\$241.00
Book value of common equity	\$5,641	\$31,640
Book value per share	\$ 2.88	\$ 34.88

Checkpoint 4.4

STEP 3: Solve

We can now calculate the price to earnings ratio and market-to-book value for both Dell and Apple as follows:

	Dell	Apple
Price to earnings ratio (PE ratio)	21.3	26.54
Market-to-book ratio	5.41	6.91

STEP 4: Analyze

Dell's share price of \$15.56 is much less than the Apple share price of \$241.00, but this tells us very little about how investors are valuing the shares of the two companies. To learn more, we standardize the market price by dividing it first by earnings per share to calculate the price-to-earnings ratio and then by book value per share to calculate the market-to-book ratio. We are now prepared to compare the prices of the two company's shares since the share prices have now been standardized. It appears that Apple enjoys a higher price per share when compared to its 2009 earnings as well as a higher book to market value ratio.

Checkpoint 4.4: *Check Yourself*

What price per share for Dell would it take to increase the firm's price-to-earnings ratio to the level of Apple?

Step 2: Decide on a Solution Strategy

- $PE = \text{Price} / \text{EPS} \rightarrow \text{Price} = PE \times \text{EPS}$
- Let $PE = 26.54$ (Apple). $EPS = 0.73$.
- $\text{Price} = 26.53 \times 0.73 = 19.47$.
- The price for Dell has to increase from 15.56 to 19.47 to match Apple's PE ratio for the same earnings per share.

Summing up the Financial Analysis of Boswell

- Liquidity: With the exception of inventory turnover ratio, liquidity ratios were adequate to good. The next step will be to see how inventory management can be improved.
- Financial Leverage: The firm uses more debt than its peers, which exposes the firm to a higher degree of financial risk or potential default on its debt in the future.
- Profitability: H.J. Boswell had favorable net operating income despite lower profit margins, largely due to its higher asset turnover ratio. The return on equity was also higher than the peer group due to use of more debt.
- Market Value Ratios: These ratios suggest that the market is pleased with the firm as indicated by higher stock valuations.

Selecting a Performance Benchmark

- There are two types of benchmarks that are commonly used:
 1. Trend Analysis – involves comparing a firm’s financial statements over time (time series analysis).
 2. Peer Group Comparisons – involves comparing the subject firm’s financial statements with those of similar, or “peer” firms. The benchmark for peer groups typically consists of firms from the same industry or industry average financial ratios. (Cross-sectional analysis).

Trend Analysis

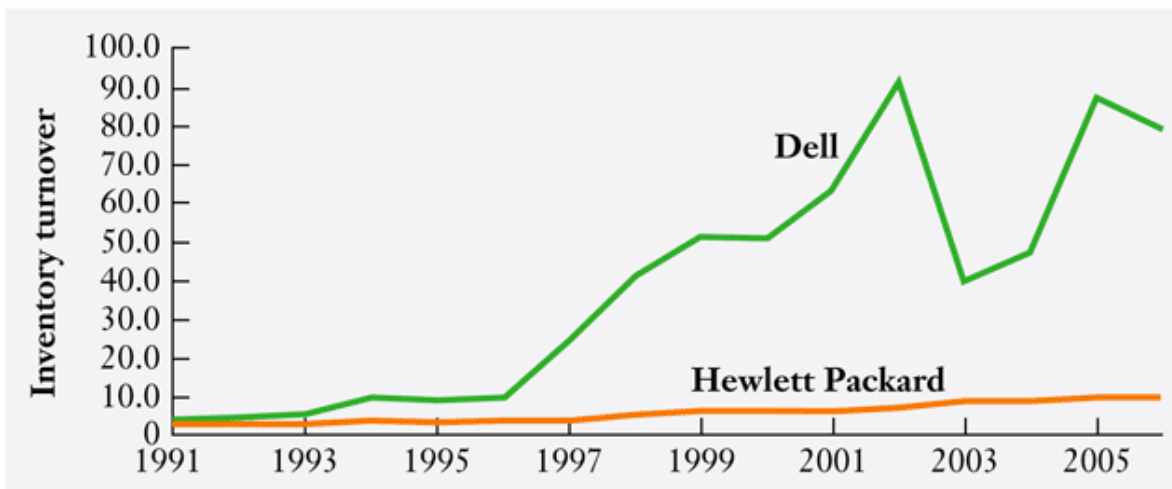
Figure 4.3

A Time-Series (Trend) Analysis: Dell's Inventory Turnover Ratio versus Hewlett Packard's: 1991–2006

Description: The inventory turnover ratio is defined as follows:

$$\frac{\text{Cost of Goods Sold}}{\text{Inventory}}$$

For example, Hewlett Packard Corporation's inventory turnover ratio is used as a benchmark for comparison purposes.



Financial Analysis of the Gap, Inc., June 2009

Figure 4.4

Financial Analysis of the Gap, Inc., June 2009

Industry average financial ratios are often used to benchmark the ratios of firms that are being analyzed. When this is done we look for deviations from the average that may indicate either a problem or a strength of the subject firm.

Financial Ratios	Gap, Inc.	Industry Average
Price/earnings ratio	14.10	15.51
Market-to-book ratio	2.99	4.71
Gross margin	40.91%	36.14%
Net profit margin	6.88%	3.51%
Operating profit margin	10.64%	7.68%
Return on equity	21.36%	28.24%
Debt ratio	1.39%	17.31%
Current ratio	1.80	1.57
Total assets turnover ratio	1.86	1.81
Inventory turnover ratio	4.94	4.31

The Limitations of Ratio Analysis

1. Picking an industry benchmark can sometimes be difficult.
2. Published peer-group or industry averages are not always representative of the firm being analyzed.
3. An industry average is not necessarily a desirable target or norm.
4. Accounting practices differ widely among firms.
5. Many firms experience seasonal changes in their operations.
6. Financial ratios offer only clues. We need to analyze the numbers in order to fully understand the ratios.
7. The results of financial analysis are dependent on the quality of the financial statements.

A summary of 17 ratios:

I. Liquidity

- ① Current ratio
- ② Acid-test (quick) ratio
- ③ Accounts receivable turnover ratio
- ④ Average collection period on accounts receivable
- ⑤ Inventory turnover ratio
- ⑥ Days' sales in inventory

II. Capital structure

- ① Debt ratio
- ② Times interest earned ratio (interest coverage ratio)

III. Asset management efficiency

- ① Total asset turnover ratio
- ② Fixed asset turnover ratio

IV. Profitability

- ① Gross/operating/net profit margin
- ② Operating return on assets (ROA)
- ③ Return on equity (ROE)

V. Market value

- ① Price to earnings ratio (PE)
- ② Market-to-book ratio