

Master of Financial Technology

FIN 615
Finance Concepts





Financial Statements Analysis

Chapter 4



Chapter 04

Intended Learning Outcomes

1. Compute a company's profits, as reflected by its income statement.
2. Determine a firm's financial position at a point in time based on its balance sheet.
3. Measure a company's cash flows.
4. Explain the purpose and importance of financial analysis.
5. Calculate and use a comprehensive set of measurements to evaluate a company's performance.
6. Describe the limitations of financial ratio analysis.

Introduction

The goal of this chapter is not to make you an accountant, but instead to provide you with the tools to **understand a firm's financial situation**.

With this knowledge, you will be able to understand the financial **consequences of a company's decisions and actions**—as well as your own.

The financial performance of a firm **matters to a lot of groups**—the company's management, its employees, and its investors, just to name a few.

This is true whether you are in the firm's marketing, finance, or human resources department.

So regardless of your position in the firm, it is in your own best interest to know the basics of financial statements—even if accounting is not your greatest love.



2. Operating Profitability

Question 2

Are the Firm's Managers Generating Adequate Operating Profits from the Company's Assets?

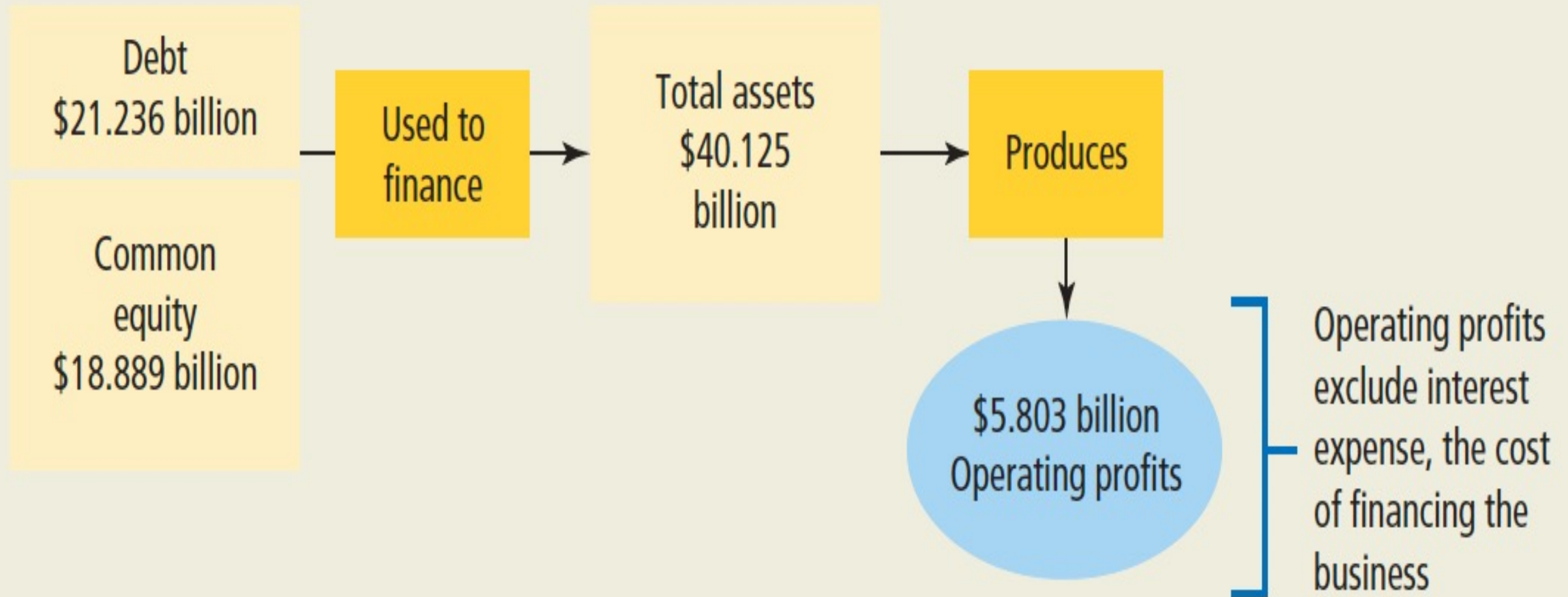


- We now switch to a different dimension of performance—the firm’s profitability.
- The question here is, “**Do the firm’s managers produce adequate profits from the company’s assets?**”
- One of the most important ways managers create shareholder value is to earn strong profits on the assets in which they have invested.

Question 2: Are the Firm's Managers Generating Adequate Operating Profits from the Company's Assets?

- To answer this all-important question, think about the process of financing a company in its simplest form, a firm's shareholders invest in a business.
- The company may also borrow additional money from other sources (banks and so forth). The purpose of making these investments is to create profits.
- Figure 4-2 graphically illustrates this process for Home Depot, where we see that the shareholders invested \$18.889 billion in the company, and that the company borrowed another \$21.236 billion, which together allowed the company to finance \$40.125 billion of assets.
- These assets were then used to produce \$5.803 billion in operating profits.

FIGURE 4-2 Home Depot Operating Profits Resulting from Asset Investments



1. Operating Return on Assets (OROA)

- Notice that **we are using operating profits rather than net income.**
- Operating profits are the income generated from the firm's assets independent of how the firm is financed..
- While knowing the dollar amount of a firm's operating profits is important, we also want to know the amount of operating profits relative to the total assets employed.
- In other words, **we want to know how much operating profit is generated per dollar of assets used; that is, we are interested in a firm's return on its asset investment.**
- We find this return by calculating the operating return on assets (OROA) as follows:

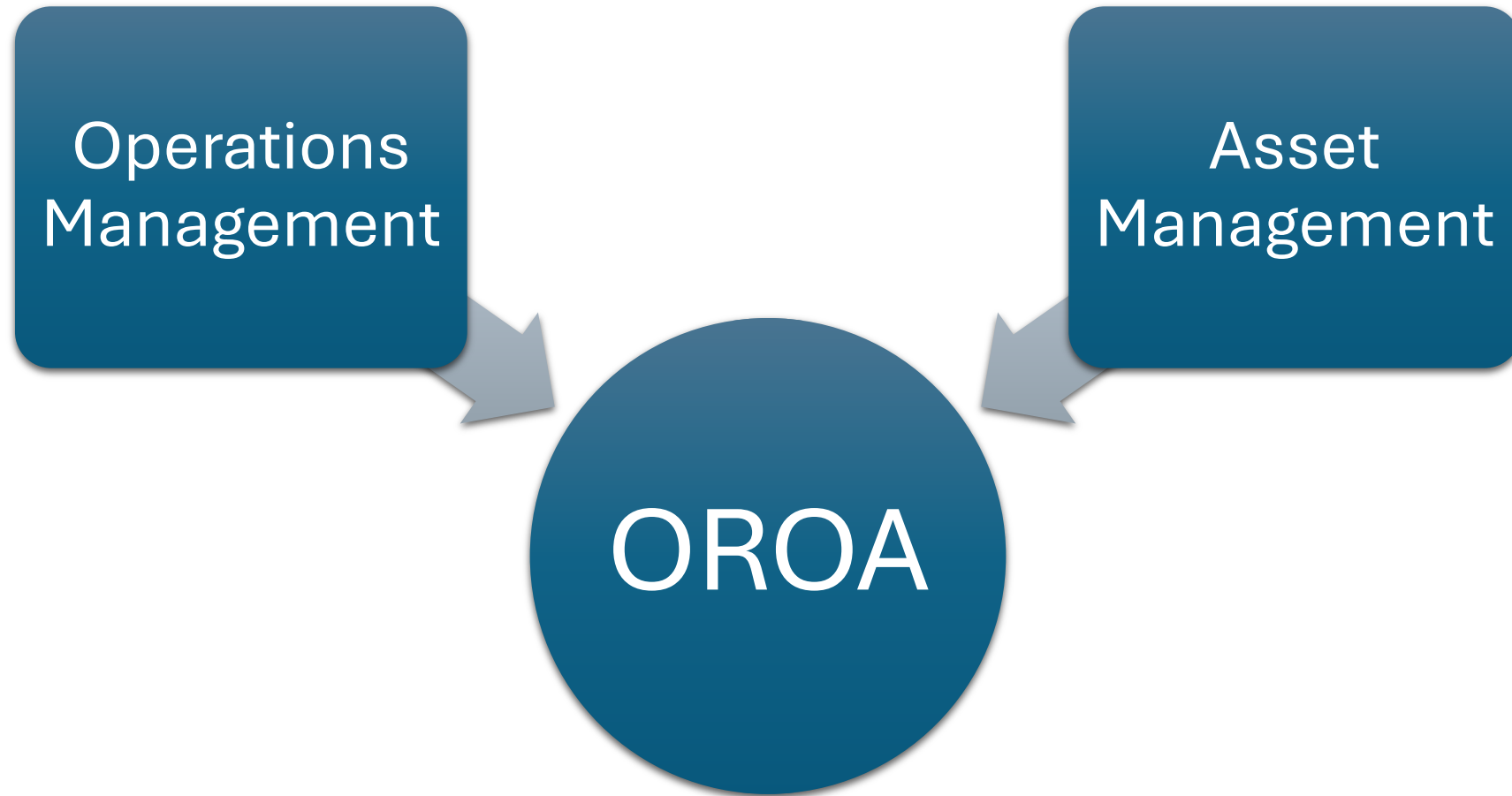
Operating return on assets = operating profits / total assets

- For Home Depot:

$$\begin{aligned}\text{Operating return on assets} &= \text{operating profits} / \text{total assets} \\ &= \$5,803\text{M} / \$40,125\text{M} = 0.145 = 14.5\%\end{aligned}$$

1. Operating Return on Assets (OROA)

- Lowe's operating return on assets 10.6%
- Thus, Home Depot earned a higher return on its assets relative to Lowe's—14.5 cents of operating profits for every \$1 of assets for Home Depot, compared to 10.6 cents for Lowe's.
- Clearly, Home Depot was doing something better than Lowe's when it came to earning a higher return on its assets. But what? The answer lies in two areas:
 - (1) how effectively the company's income statement was being managed or what we will call **operations management**, which involves the day-to-day buying and selling of a firm's goods or services as reflected in the income statement; and
 - (2) how efficiently assets are being managed to generate sales, or **asset management**.
- **That these two issues relate to the operating return on assets can be seen by using two other ratios—operating profit margin and total asset turnover.**



$$\text{Operating return on assets} = \text{operating profit margin} \times \text{total asset turnover}$$

calculated as follows:

$$\text{Operating return on assets} = \frac{\text{operating profit}}{\text{sales}} \times \frac{\text{sales}}{\text{total assets}}$$

Managing Operations

- The first component of the operating return on assets (OROA), the operating profit margin, is an indicator of how well the company manages its operations—that is, how well revenues are being generated and costs and expenses controlled.
- The operating profit margin measures how well a firm is managing its cost of operations, in terms of both the cost of goods sold and operating expenses (marketing expenses, general and administrative expenses, and depreciation expenses) relative to the firm's revenues.
- All else being equal, the objective for managing operations is to keep costs and expenses low relative to sales. Thus, we use the operating profit margin to measure how well the firm is managing its income statement, where:

$$\text{Operating profit margin} = \text{operating profits} / \text{sales}$$

- For Home Depot:

$$\begin{aligned}\text{Operating profit margin} &= \text{operating profits} / \text{sales} = \$5,803\text{M} / \$67,997\text{M} \\ &= 0.085 = 8.5\%\end{aligned}$$

Managing Operations

- **Lowe's operating profit margin 7.3%**
- The foregoing result clearly indicates that Home Depot's managers were better at managing its cost of goods sold and operating expenses than Lowe's.
- Home Depot had lower costs per sales dollar, which resulted in a higher operating profit margin.
- Put another way, Home Depot was better than Lowe's at managing its income statement.
- Thus, one reason for Home Depot's higher operating return on assets was its higher operating profit margin.

Managing Assets

- The second component in equation is the total asset turnover.
- This ratio tells us how efficiently a firm is using its assets to generate sales. To clarify, assume that Company A generates \$3 in sales for every \$1 invested in assets, whereas Company B generates the same \$3 in sales but has invested \$2 in assets.
- In other words, Company A is using its assets more efficiently to generate sales, which leads to a higher return on the firm's investment in assets.
- This efficiency is captured by the total asset turnover ratio, shown again as follows:
- Total asset turnover = sales / total assets
- For Home Depot:
- Total asset turnover = sales / total assets = \$67,997M / \$40,125M = 1.69X

Managing Assets

- **Lowe's total asset turnover 1.45X**
- We now know that Home Depot is using its assets more efficiently than Lowe's, generating \$1.69 in sales per dollar of assets, whereas Lowe's produces only \$1.45.
- This is the second reason for Home Depot's higher operating return on assets—the first being the higher operating profit margin

Asset management

- However, we should not stop here with our analysis of Home Depot's asset management.
- We have learned that, in general, Home Depot's managers are making efficient use of the firm's assets, but this may not be the case for each type of asset.
- We also want to know how well the firm is managing its main operating assets, accounts receivable, inventories, and fixed assets, respectively.
- To answer this question, we can compute the turnover ratios for each of these asset categories.

Asset Management

- Of course, we have already calculated the turnover ratios for the company's accounts receivable and inventories and concluded that Home Depot's managers were not managing accounts receivable as efficiently as Lowe's but were turning over inventories more quickly.
- We still need to compute the fixed asset turnover, which we do as follows:

$$\text{Fixed asset turnover} = \text{sales} / \text{net fixed assets}$$

- For Home Depot:

$$\text{Fixed asset turnover} = \text{sales} / \text{net fixed assets} = \$67,997\text{M} / \$25,060\text{M} = 2.71\text{X}$$

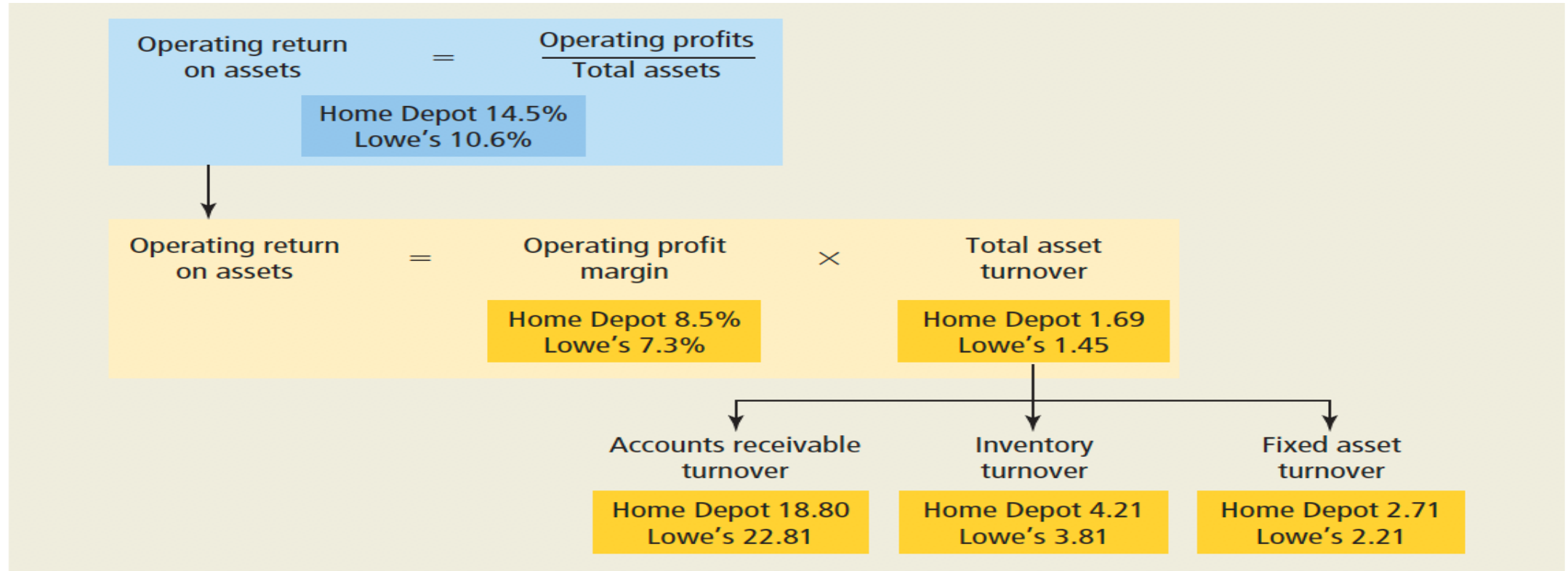
- Lowe's fixed asset turnover 2.21X
- Thus, Home Depot has a smaller investment in fixed assets relative to the firm's sales than does Lowe's.
- **Lowe's fixed asset turnover 2.21X**
- Thus, Home Depot has a smaller investment in fixed assets relative to the firm's sales than does Lowe's.

Asset Efficiency Ratios

	HOME DEPOT	LOWE'S
Total asset turnover	1.69X	1.45X
Accounts receivable turnover	18.80X	22.81X
Inventory turnover	4.21X	3.81X
Fixed assets turnover	2.71X	2.21X

- Home Depot's situation with respect to asset management is now clear.
- Overall, Home Depot's managers are utilizing their firm's assets efficiently, based on the firm's total asset turnover.
- This overall asset efficiency results from better management of the firm's inventories and fixed assets (which have higher turnovers than Lowe's).
- However, the firm is not managing its accounts receivable as well: Home Depot's accounts receivable turnover is lower than Lowe's.

Analysis of Home Depot's Operating Return on Assets



FINANCIAL DECISION TOOLS

Name of Tool	Formula	What It Tells You
Operating return on assets (OROA)	$\frac{\text{operating profits}}{\text{total assets}}$ or $\text{operating profit margin} \times \text{total assets turnover}$	The rate of return being earned on a firm's assets. A higher (lower) return indicates more (less) operating profits per dollar of assets invested.
Operating profit margin	$\frac{\text{operating profits}}{\text{sales}}$	Overall measure of day-to-day operating effectiveness—how well revenues are being generated and costs and expenses controlled. A higher (lower) margin means a firm is better (worse) at managing its day-to-day operations.
Total asset turnover	$\frac{\text{sales}}{\text{total assets}}$	Measures how efficiently a firm is using its total assets. A higher turnover means the firm is using its assets more efficiently.
Days in receivables 	$\frac{\text{accounts receivable}}{\text{annual credit sales} \div 365}$	Measures how rapidly a firm is collecting its receivables. A longer (shorter) period means slower (faster) collections and a larger (smaller) investment in receivables.
Accounts receivable turnover	$\frac{\text{annual credit sales}}{\text{accounts receivable}}$	The number of times a firm's accounts receivable are collected, or <i>turned over</i> , during a year. Provides the same information as the <i>days in receivables</i> , just expressed differently.
Days in inventory 	$\frac{\text{inventory}}{\text{annual cost of goods sold} \div 365}$	Measures how many days a firm's inventories are held on average before being sold; the more (less) days required, the larger (smaller) will be the investment in inventories.
Inventory turnover	$\frac{\text{cost of goods sold}}{\text{inventory}}$	The number of times a firm's inventories are sold and replaced during the year; provides the same information as the <i>days in inventory</i> , just expressed differently.
Fixed asset turnover	$\frac{\text{sales}}{\text{net fixed assets}}$	Measures how efficiently the firm is using its fixed assets. A higher (lower) turnover means the firm is using its fixed assets more (less) efficiently.

3. Capital Structure

Question 3

How Is the Firm Financing Its Assets?

Sources of Finance

- The key issue is management's choice between financing with debt or with equity.
- To begin, we want to know what percentage of the firm's assets is financed by debt, including both short-term and long-term debt, realizing that the remaining percentage must be financed by equity.
- To answer this question, we compute the debt ratio as follows:

$$\text{Debt ratio} = \text{total debt} / \text{total assets}$$

Sources of Finance

- For Home Depot:

Debt ratio = total debt / total assets

$$= \$21,236\text{M} / \$40,125\text{M} = 0.53 = 53\%$$

- **Lowe's debt ratio 46%**
- Home Depot finances 53 percent of its assets with debt, compared with Lowe's 46 percent.
- Stated differently, Home Depot finances with 47 percent equity, whereas Lowe's is 54 percent equity.
- Thus, Home Depot uses more debt than Lowe's.
- Keep in mind that, more debt financing results in more financial risk.

Sources of Finance

- Instead of using the debt ratio, we could use the debt–equity ratio.
- The debt–equity ratio is simply a transformation of the debt ratio:

$$\text{Debt-equity ratio} = \text{total debt} / \text{total equity}$$

Repayment of Debt

- Our second perspective regarding the firm's financing decisions comes from looking at the income statement.
- When the firm borrows money, it must at least pay the interest on what it has borrowed. Thus, it is informative to compare
 - (1) the amount of operating profits that are available to pay the interest with (2) the amount of interest that has to be paid.
- **The times interest earned ratio** is commonly used when examining a firm's debt position, stated as a ratio, we compute the number of times the firm is earning its interest.
- It is computed in the following manner:

$$\text{Times interest earned} = \text{operating profits} / \text{interest expense}$$

- This ratio measures a firm's ability to meet its interest payments from its annual operating earnings.

Repayment of Debt

- For Home Depot:
Times interest earned = operating profits / interest expense
= \$5,803M / \$530M = 10.9X
- **Lowe's times interest earned 9.0X**
- Home Depot's interest expense is \$530 million, which when compared to its operating profits of \$5.803 billion (\$5,803 million) indicates **that its interest expense is consuming less of the operating profits** than is the case for Lowe's.
- Home Depot's higher times interest earned can be attributed to the firm's relatively higher operating profits, as reflected in a higher operating return on assets.
- **The higher the profits, the higher will be the time interested earned.**
- Home Depot's higher debt ratio would most likely lower the times interest earned, relative to Lowe's, since the more debt you have, the more interest you will pay.
- However, Home Depot's higher income apparently more than covers any additional interest expense on its greater amount of debt.

Repayment of Debt

- Before concluding our discussion regarding times interest earned, we should understand that **interest is not paid with income but with cash.**
- Moreover, in addition to the interest that must be paid, the firm will also be required to repay the debt principal.
- Thus, the times interest earned ratio is only a crude measure of the firm's capacity to service its debt.
- Nevertheless, it does give us a general indication of a company's financial risk and its capacity to borrow.

Repayment of Debt

- A problem with the TIE ratio is that it is based on EBIT, which is not really a measure of cash available to pay interest.
- The reason is that depreciation, a noncash expense, has been deducted out. Because interest is most definitely a cash outflow (to creditors), one way to define the cash coverage ratio is:

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

- The numerator here, EBIT plus depreciation, is often abbreviated EBDIT (earnings before depreciation, interest, and taxes). 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.

FINANCIAL DECISION TOOLS

Name of Tool	Formula	What It Tells You
Debt Ratio	$\frac{\text{total debt}}{\text{total assets}}$	The percentage of assets that is financed with debt. The higher (lower) the debt ratio, the more (less) financial risk the firm is assuming.
Times interest earned	$\frac{\text{operating profits}}{\text{interest expense}}$	The number of times a firm is earning its interest expense. Indicates a company's ability to service its fixed interest payments. A higher (lower) value means the firm is more (less) able to service its debt.

4. Profitability

Question 4

**Are the Firm's Managers Providing a Good
Return
on the Capital Provided by the Shareholders?**

1. Return on Equity

- We now want to determine if the firm's owners (shareholders) are receiving an attractive return on their equity investment when compared to the return on equity at competing firms.
- For this, we use the return on equity (frequently shortened to ROE), which is computed as follows:

$$\text{Return on equity} = \text{net income} / \text{total common equity}$$

1. Return on Equity

- **For Home Depot:**

Return on equity = net income / total common equity
= \$3,338M / \$18,889M = 0.177 = 17.7%

- **Lowe's return on equity 11.1%**

- In the computation above, remember that the total common equity includes all common equity in the balance sheet, including par value, paid-in capital, and retained earnings, less any treasury stock.
- The returns on equity for Home Depot and Lowe's are 17.7 percent and 11.1 percent, respectively. Hence, the owners of Home Depot are receiving a higher return on their equity investment than are the shareholders of Lowe's.

2. Return on assets

- Return on assets (ROA) is a measure of profit per dollar of assets. It can be defined several ways, but the most common is:

$$\text{Return on assets} = \frac{\text{net income}}{\text{total assets}} = \frac{\$3631}{\$3588} = 10.12\%$$

5. Market Value

Question 5

Are the Firm's Managers Creating Shareholder Value

Market-Value Ratios

- To this point, we have relied exclusively on accounting data to assess the performance of a firm's managers.
- We now want to look at management's performance in terms of creating or destroying shareholder value.
- To answer this question, we examine market-value ratios

Market-Value Ratios

- There are two ratios commonly used to compare a firm's stock price to its earnings and to accounting book value of its equity.
- These two ratios indicate what investors think of management's past performance and future prospects.
 1. **Price/earnings ratio** the price the market places on \$1 of a firm's earnings. For example, if a firm has an earnings per share of \$2, and a stock price of \$30 per share, its price/earnings ratio is 15. ($\$30 / \2).
 2. **Price/book ratio** the market value of a share of the firm's stock divided by the book value per share of the firm's reported equity in the balance sheet. Indicates the market price placed on \$1 of capital that was invested by shareholders.

Price/Earnings Ratio

- The price/earnings (P/E) ratio indicates how much investors are willing to pay for \$1 of reported earnings.
- Returning to Home Depot, the firm had net income in the fiscal year of 2010 of \$3.338 billion and 1.623 billion shares of common stock outstanding.
- Accordingly, its earnings per share were \$2.06 (\$2.06 = \$3,338 million net income / 1,623 million shares). At the time, the firm's stock was selling for \$36.77 per share. Thus, the price/earnings ratio was 17.85 times, calculated as follows:

Price/earnings ratio = market price per share / earnings per share

For Home Depot:

- Price/earnings ratio = market price per share / earnings per share
= \$36.77 / \$2.06 = 17.85X

Price/Earnings Ratio

- **Lowe's price/earnings ratio 16.90X**
- Home Depot's price/earnings ratio tells us that the investors were willing to pay \$17.85 for every dollar of earnings per share that Home Depot produced, compared to only \$16.90 for \$1 of earnings from Lowe's.
- Thus, investors were willing to pay somewhat more for Home Depot's earnings than they were for Lowe's.
- Why might that be? The price/earnings ratio will be higher for companies that investors think have strong earnings growth prospects and/or less risk.
- Thus, investors must perceive Home Depot to have more growth potential and/or smaller risk than Lowe's.

Price/Book Ratio

- A second frequently used indicator of investors' assessment of the firm is its price/book ratio.
- This ratio compares the market value of a share of stock to its book value per share.
- Book value per share comes from of the firm's total common equity in its balance sheet. We already know that the market price of Home Depot's common stock was \$36.77. To determine the equity book value per share, we divide the firm's equity book value (total common equity) by the number of shares of stock outstanding. From Home Depot's balance sheet, we see that the equity book value was \$18.889 billion.
- Given that Home Depot had 1.623 billion shares outstanding, the equity book value per share is \$11.64 (\$11.64 = \$18.889 billion book equity value , 1.623 billion shares. With this information, we determine the price/book ratio to be:

Price/book ratio = market price per share / equity book value per share

- **For Home Depot:**

Price/book ratio = market price per share / equity book value per share
= \$36.77 / \$11.64 = 3.16X

Price/Book Ratio

- **Lowe's price/book ratio 1.95X**
- Given that the book value per share is an accounting number that reflects historical costs, we can think of it roughly as the amount shareholders have invested in the business over its lifetime.
- Thus, **a ratio greater than 1** indicates that investors believe the firm is more valuable than the amount shareholders have invested in it.
- Conversely, **a ratio less than 1** suggests that investors do not believe the stock is worth the amount shareholders have invested in it.
- Clearly, investors believed that Home Depot's stock was worth more than was originally invested in the company, since they were willing to pay \$3.16 per share for each dollar of equity book value (total common equity).
- In comparison, Lowe's stock was selling for only \$1.95 for every \$1 in book equity.
- Again, the investors were signaling that they believed that Home Depot had more growth prospects relative to its risk.

TABLE 4.3 Home Depot, Inc. Financial Ratio Analysis (*Continued*)

FINANCIAL RATIOS	HOME DEPOT	LOWE'S
5. CREATING SHAREHOLDER VALUE		
Price earnings ratio = $\frac{\text{market price per share}}{\text{earnings per share}}$	$\frac{\$36.77}{\$2.06} = 17.85X$	16.90X
Price book ratio = $\frac{\text{market price per share}}{\text{equity book value per share}}$	$\frac{\$36.77}{\$11.64} = 3.16X$	1.95X
EVA = $\left(\frac{\text{operating return on assets} - \text{cost of capital}}{\text{total assets}} \right) \times \text{total assets}$	$(0.145 - 0.10) \times \$40.125 \text{ billion}$ $= \$1.806 \text{ billion}$	Not computed

The Limitations of Financial Ratio Analysis

1. **It is sometimes difficult to determine the industry to which a firm belongs when the firm engages in multiple lines of business.** In this case, you must select your own set of peer firms and construct your own norms.
2. **Published peer group or industry averages are only approximations.** They provide the user with general guidelines, rather than scientifically determined averages of the ratios for all—or even a representative sample—of the firms within an industry.
3. **An industry average is not necessarily a desirable target ratio or norm.** There is nothing magical about an industry norm. At best, an industry average indicates the financial position of the average firm within the industry. It does not mean that value is the ideal or best value for the ratio. For various reasons, a well-managed company might be above the average, whereas another equally good firm might choose to be below the average.

The Limitations of Financial Ratio Analysis

4. **Accounting practices differ widely among firms.** For example, different firms choose different methods to depreciate their fixed assets. Differences such as these can make the computed ratios of different firms difficult to compare.
5. **Financial ratios can be too high or too low.** For example, a current ratio that exceeds the industry norm might signal the presence of excess liquidity, resulting in lower profits relative to the firm's investment in assets. On the other hand, a current ratio that falls below the norm might indicate that (1) the firm has inadequate liquidity and may at some future date be unable to pay its bills on time, or (2) the firm is managing its accounts receivable and inventories more efficiently than other, similar firms.
6. **Many firms experience seasonal changes in their operations.** As a result, their balance sheet entries and their corresponding ratios will vary with the time of year the statements are prepared. To avoid this problem, an average account balance should be used (one calculated on the basis of several months or quarters during the year) rather than the year-end account balance. For example, an average of the firm's month-end inventory balance might be used to compute its inventory turnover ratio versus a year-end inventory balance.

Thank You

