

Module 4

Analyzing and Interpreting Financial Statements

Learning Objectives

- LO1** Compute and interpret return on equity (ROE). (p. 4-3)
- LO2** Apply DuPont disaggregation of ROE into return on assets (ROA) and financial leverage. (p. 4-4)
- LO3** Disaggregate ROA into profitability and productivity and analyze both. (p. 4-6)
- LO4** Identify balance sheet operating items and compute net operating assets. (p. 4-14)
- LO5** Identify income statement operating items and compute net operating profit after tax. (p. 4-20)
- LO6** Compute and interpret return on net operating assets (RNOA). (p. 4-24)
- LO7** Disaggregate RNOA into net operating profit margin and net operating asset turnover. (p. 4-26)
- LO8** Compute and interpret nonoperating return (Appendix 4A). (p. 4-31)
- LO9** Compute and interpret measures of liquidity and solvency (Appendix 4B). (p. 4-36)

INTC

Market cap: \$165,530 mil
Total assets: \$103,065 mil
Revenues: \$55,355 mil
Net income: \$11,420 mil

Intel is a leader in the design and manufacturing of advanced integrated digital technology platforms. Its strategy is to offer complete and connected platform computing solutions, consisting of both hardware and software, and to continue to drive "Moore's Law." Through enhanced energy-efficient performance, connectivity, and security, Intel enables platform solutions that span the continuum.

So, how should we measure Intel's financial performance? A company's performance is commonly judged by its profitability. Although the usual focus on profit is important, it is only part of the story. A more meaningful analysis is to compare level of profitability with the amount of capital that has been invested in the business. The most common measure is return on equity (ROE), which is computed as net income divided by average stockholders' equity and focuses on shareholder investment as its measure of invested capital. By focusing on the equity investment, ROE measures return from the perspective of the common shareholder rather than the company overall. Intel's ROE for 2015 was 19.5%, down slightly from 20.5% in the prior year.

Let's consider two other return metrics: return on assets (ROA) and return on net operating assets (RNOA). Return on assets (ROA) measures the profitability of the total assets owned by the company. In 2015, Intel reported an impressive net income of \$11 billion. What level of assets was used to generate this \$11 billion? Intel's average total assets was \$97,483 million during 2015. By dividing net income by average total assets during the year, we see that Intel's ROA, the return on total assets, was 11.7%—for every dollar of assets held by Intel during 2015, the company earned just under 12 cents.

The difference between ROE and ROA shows the effects of the company's use of debt. Intel has borrowed money and invested in assets that create a return. By borrowing at rates that are less than the company's ROA, Intel has substantially increased the shareholders' investment from 11.7% ROA to 19.5% ROE. However, debt can increase the company's risk—where severe consequences can result if debt is not repaid when due.

A potentially more informative metric to use when assessing performance is return on net operating assets (RNOA). RNOA focuses on the returns from the assets that a company uses for operations, net of any operating liabilities. Compared to ROA, RNOA is a more precise measure of the profitability from a company's core operations because RNOA disregards ancillary, or "nonoperating" activities. For Intel, RNOA measures the profitability of the design, manufacturing, and selling of integrated digital technology platforms and excludes the return from investments. In 2015, Intel's RNOA was 22.9%, nearly double its ROA of 11.7%. [Source: Intel 2015 10-K.]



Road Map

LO	Learning Objective Topics	Page	eLecture	Guided Example	Assignments
4-1	Compute and interpret return on equity (ROE). ROE Definition :: ROE Computation :: ROE Interpretation	4-3	e4-1	Review 4-1	1, 6, 18, 22, 26, 30, 34, 35, 36, 42, 48, 49, 54, 55, 57
4-2	Apply DuPont disaggregation of ROE into return on assets (ROA) and financial leverage. ROE Disaggregation :: Return on Assets :: Financial Leverage	4-4	e4-2	Review 4-2	2, 5, 19, 26, 30, 34, 36, 42, 54, 55
4-3	Disaggregate ROA into profitability and productivity and analyze both. ROA Disaggregation :: Profitability :: Productivity :: Financial Leverage	4-6	e4-3	Review 4-3	16, 19, 26, 30, 34, 42, 54, 55, 61, 62, 63
4-4	Identify balance sheet operating items and compute net operating assets. Operating Focus on Balance Sheet :: RNOA Motivation :: NOA Computation	4-14	e4-4	Review 4-4	9, 20, 24, 41, 45, 48, 50, 51, 59
4-5	Identify income statement operating items and compute net operating profit after tax. Operating Focus on Income Statement :: Operating vs Nonoperating :: NOPAT Computation :: Income Tax Expense	4-20	e4-5	Review 4-5	7, 8, 21, 25, 29, 40, 41, 45, 48, 50, 51, 59
4-6	Compute and interpret return on net operating assets (RNOA). RNOA Computation :: ROA vs RNOA :: ROA components :: Key Definitions	4-24	e4-6	Review 4-6	6, 22, 23, 27, 31, 32, 33, 35, 36, 41, 45, 48, 50, 51, 56, 57, 59
4-7	Disaggregate RNOA into net operating profitability and net operating asset turnover. RNOA Disaggregation :: Net Operating Profit Margin :: Net Operating Asset Turnover :: Trade-Off of Margin and Turnover	4-26	e4-7	Review 4-7	3, 4, 10, 11, 15, 22, 23, 27, 29, 31, 32, 33, 35, 41, 45, 48, 50, 51, 53, 56, 57, 59
4-8	Compute and interpret nonoperating return (Appendix 4A). Nonoperating Return Components :: Under Various Conditions	4-31	e4-8	Review 4-8	1, 41, 44, 47, 49, 51, 52, 59
4-9	Compute and interpret measures of liquidity and solvency (Appendix 4B). Liquidity Analysis :: Solvency Analysis :: Vertical and Horizontal Analysis :: Limitations of Ratios	4-36	e4-9	Review 4-9	12, 13, 17, 28, 37, 38, 39, 43, 46, 58, 60

Analyzing and Interpreting Financial Statements

Return on Equity (ROE)	Return on Assets (ROA)	Operating Focus	Nonoperating Return	Liquidity and Solvency
<ul style="list-style-type: none"> ■ Measuring ROE ■ Disaggregating ROE with DuPont Analysis ■ Components: Return on Assets and Financial Leverage 	<ul style="list-style-type: none"> ■ Measuring ROA ■ Profitability (Profit Margin) ■ Productivity (Asset Turnover) ■ Financial Leverage: Link to ROE 	<ul style="list-style-type: none"> ■ Operating Revenues and Expenses ■ Tax on Operating Profit ■ Operating Assets and Liabilities ■ Disaggregating RNOA into Margin and Turnover 	<ul style="list-style-type: none"> ■ Measuring Nonoperating Return ■ Leveraging Debt to Increase ROE ■ Risks of Debt Financing ■ Debt Covenants 	<ul style="list-style-type: none"> ■ Liquidity: Current Ratio and Quick Ratio ■ Solvency: Liabilities-to-Equity and Times Interest Earned Ratios ■ Limitations of Ratio Analysis

Return on Equity (ROE)



The most common analysis metric used by managers and investors alike, is **return on equity (ROE)**, a powerful summary measure of company performance defined as:¹

$$\text{ROE} = \frac{\text{Net income}}{\text{Average stockholders' equity}}$$

ROE relates net income to the average total stockholders' equity from the balance sheet. ROE measures return from the perspective of the company's stockholders. ROE is an important metric and, in the five years from 2011–2015, return on equity of the S&P 500 firms has ranged from 14% to 15%. Exhibit 4.1 includes Intel's income statement and balance sheet data used to compute its ROE for 2015 of 19.53%.

Exhibit 4.1 ■ Financial Statement Data for Intel Corporation

\$ millions	Dec. 26, 2015	Dec. 27, 2014
Sales.....	\$ 55,355	\$ 55,870
Net income.....	11,420	11,704
Total assets.....	103,065	91,900
Total stockholders' equity.....	61,085	55,865
ROE = $\frac{\$11,420}{(\$61,085 + \$55,865)/2}$	19.53%	

ROE is a summary return metric that measures the return the company has earned on the book (reported) value of the shareholders' investment. It is one measure of how effective management has been in its role as stewards of the capital invested by shareholders. In our analysis of company performance, we seek to uncover the *drivers* of ROE and how those drivers have trended over time so that we are better able to predict future performance.

¹ ROE uses net income, in the numerator, that represents profit earned *during* the year. Therefore, the denominator would ideally reflect equity that the company had *throughout* the year. As an approximation, we use a simple average of the balance sheet values for equity at the start and end of the year to reflect equity during the year.

Following are selected income statement and balance sheet data for **Cisco Systems Inc.**



\$ millions	July 25, 2015	July 26, 2014
Sales.....	\$ 49,161	\$ 47,142
Net income.....	8,981	7,853
Total assets.....	113,481	105,070
Cisco shareholders' equity.....	59,698	56,654

Required

Compute return on equity (ROE) for Cisco Systems for fiscal 2015.

Solution on p. 4-64.

ROE Disaggregation: DuPont Analysis

There are two methods for disaggregating ROE into its components; each provides a different perspective that can inform our analysis.

- The first method is the traditional DuPont analysis that disaggregates return on equity into components of profitability, productivity, and leverage.
- The second method extends the traditional DuPont analysis by taking an *operating focus* that separates operating and nonoperating activities. Operating activities are the drivers of shareholder value. This method, which focuses on operating or core activities, provides insight into the factors that drive value creation.

LO2 Apply DuPont disaggregation of ROE into return on assets (ROA) and financial leverage.

Disaggregation of return on equity (ROE) was initially introduced by the **E.I. DuPont de Nemours and Company** to aid its managers in performance evaluation. DuPont realized that management's focus on profit alone was insufficient because profit can be increased simply by the purchase of additional investment in low-yielding, but safe, assets. DuPont wanted managers to think like investors and to manage their portfolio of activities using investment principles that allocate scarce investment capital to competing projects in descending order of return on investment (so-called capital budgeting approach). The DuPont model incorporates this investment perspective into performance measurement by disaggregating ROE into two components.

$$\text{ROE} = \frac{\text{Net income}}{\text{Average stockholders' equity}} = \frac{\text{Net income}}{\text{Average total assets}} \times \frac{\text{Average total assets}}{\text{Average stockholders' equity}}$$

Return on Assets
(ROA)
Financial
Leverage

Return on equity takes the perspective of company's shareholders and measures rate of return on shareholders' investment—how much net income is earned relative to the equity invested by shareholders. It reflects *both* company performance (as measured by return on assets) *and* how assets are financed (relative use of liabilities and equity). ROE is higher when there is more debt and less equity for a given level of assets (this is because the denominator in ROE, equity, is smaller). There is, however, a tradeoff: while using more debt and less equity results in higher ROE, the greater debt means higher risk for the company.

Return on Assets Component

Return on assets (ROA) measures return from the perspective of the entire company. This return includes both profitability (numerator) and total company assets (denominator). To earn a high return on assets, the company must be profitable *and* manage assets to minimize the assets invested to the level necessary to achieve its profit.

Most operating managers understand the income statement and the focus on profit. However, many of the same managers fail to manage the balance sheet (the denominator in ROA). ROA analysis encourages managers to focus on the profit achieved from the invested capital under their control.

This means that managers seek to increase profits with the same level of assets *and* to decrease assets without decreasing the level of profit. It is this dual focus that makes return on assets a powerful performance measure—focusing managers’ attention on *both* the income statement and balance sheet.

Intel’s net income is \$11,420 million and its total assets are \$103,065 million and \$91,900 million at fiscal-year-end for 2015 and 2014, respectively (data from Exhibit 4.1). Intel’s 11.71% return on assets is computed as follows.

$$\text{ROA} = \frac{\$11,420 \text{ million}}{(\$103,065 \text{ million} + \$91,900 \text{ million})/2} = 11.71\%$$

By comparison, the median return on assets of the S&P 500 companies for the same period was 5.2% and ranged from 5.2% to 6.2% for the 2011–2015 period.

Financial Leverage Component

Financial leverage, the second component of ROE, measures the degree to which the company finances its assets with debt versus equity. Financial leverage is measured in the DuPont analysis as the ratio of average total assets to average stockholders’ equity. An increase in this ratio implies an increase in the relative level of debt. This is evident from the accounting equation: assets = liabilities + equity. For example, if assets are financed equally with debt and equity, the accounting equation, expressed in percentage terms is: $100\% = 50\% + 50\%$, and financial leverage is 2.0 ($100\%/50\%$). If debt increases to 75%, the accounting equation is: $100\% = 75\% + 25\%$, and financial leverage is 4.0 ($100\%/25\%$).

Measuring financial leverage is important because debt is a contractual obligation and a company’s failure to repay principal or interest can result in legal repercussions or even bankruptcy. As financial leverage increases so does the level of debt payments, which all else equal, increases the probability of default and possible bankruptcy. For fiscal 2015, Intel’s financial leverage is 1.67, computed as:

$$\text{Financial leverage} = \frac{(\$103,065 \text{ million} + \$91,900 \text{ million})/2}{(\$61,085 \text{ million} + \$55,865 \text{ million})/2} = 1.67$$

By comparison, the median financial leverage of the S&P 500 companies for the same period was 2.74 and ranged from 2.4 to 2.7 for the 2011–2015 period.

Business Insight ■ Which Accounts Are Used to Compute ROE?

Return on equity has net income in the numerator and stockholders’ equity in the denominator. The complexity of company financial statements, however, presents some complications: which net income and stockholders’ equity accounts should we use?

- **Preferred Stock.** The ROE formula takes the perspective of the *common* stockholder in that it relates the income available to pay common dividends to the average common stockholder. The presence of preferred stock on the balance sheet requires two adjustments to ROE.
 1. Preferred dividends are subtracted from net income in the numerator.
 2. Preferred stock is subtracted from stockholders’ equity in the denominator.

This modified return on equity is labeled *return on common equity* (ROCE).

$$\text{ROCE} = \frac{\text{Net income} - \text{Preferred dividends}}{\text{Average stockholders' equity} - \text{Average preferred equity}}$$

- **Noncontrolling interests.** Many companies have two sets of stockholders: those that own the common stock of the parent company whose financial statements are under analysis (called *controlling interest*) and those that own shares in one or more of the parent company’s subsidiaries (called *noncontrolling interest*). Companies separately identify the stockholders’ equity relating to each group and, likewise, net income attributable to each. ROE is computed from the perspective of the controlling (parent company) stockholders and, thus, the numerator is net income attributable to parent company’s stockholders and the denominator is equity attributable to parent company’s stockholders. We explain controlling and noncontrolling interest in a later module and ROE computations with noncontrolling interests in Appendix 4A.

Refer to the financial information for **Cisco Systems** reported in Review 4-1.



Required

Compute return on assets (ROA) and financial leverage following DuPont disaggregation of ROE for fiscal 2015. Confirm that $ROA \times$ Financial leverage = ROE.

Solution on p. 4-64.

Return on Assets and its Disaggregation

Return on assets (ROA) includes both profitability (in the numerator) and total assets (in the denominator). Managers can increase ROA by increasing profitability for a given level of asset investment or by reducing assets invested to generate a given level of profitability, or both. We gain insight into these two drivers by disaggregating return on assets into two components to isolate its profitability and asset investment levels as:

$$ROA = \frac{\text{Net income}}{\text{Average total assets}} = \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average total assets}}$$

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    graph TD
      A[Profit Margin] --> B["x"]
      C[Asset Turnover] --> B
      B --> D[Return on assets (ROA)]
  
```

LO3
MBC Disaggregate ROA into profitability and productivity and analyze both.

Return on assets is the product of profit margin and utilization of assets in generating sales (asset turnover). This is the insight that DuPont analysis offers as it focuses managers' attention on both profitability *and* management of the balance sheet. The two drivers of return on assets are:

- **Profit margin (PM).** PM is what the company earns on each sales dollar; a company increases profit margin by increasing its gross profit margin (Gross profit/Sales) and/or reducing its operating expenses as a percent of sales.
- **Asset turnover (AT).** AT is the sales level generated from each dollar invested in assets; a company increases asset turnover (*productivity*) by increasing sales volume with no increase in assets and/or by reducing assets invested without reducing sales.

Business Insight Adjusted ROA

Return on assets is typically under the control of operating managers while the capital structure decision (the relative proportion of debt and equity) is not. Accordingly, a common adjustment is made to the numerator of ROA by adding back the after-tax net interest expense (net of any interest revenue or other nonoperating expense or revenue reported after operating income). The adjusted ROA for **Intel** is as follows (\$ in millions).

$$\text{Adjusted ROA} = \frac{\text{Net income} + [\text{Net interest expense} \times (1 - \text{Statutory tax rate})]}{\text{Average total assets}}$$

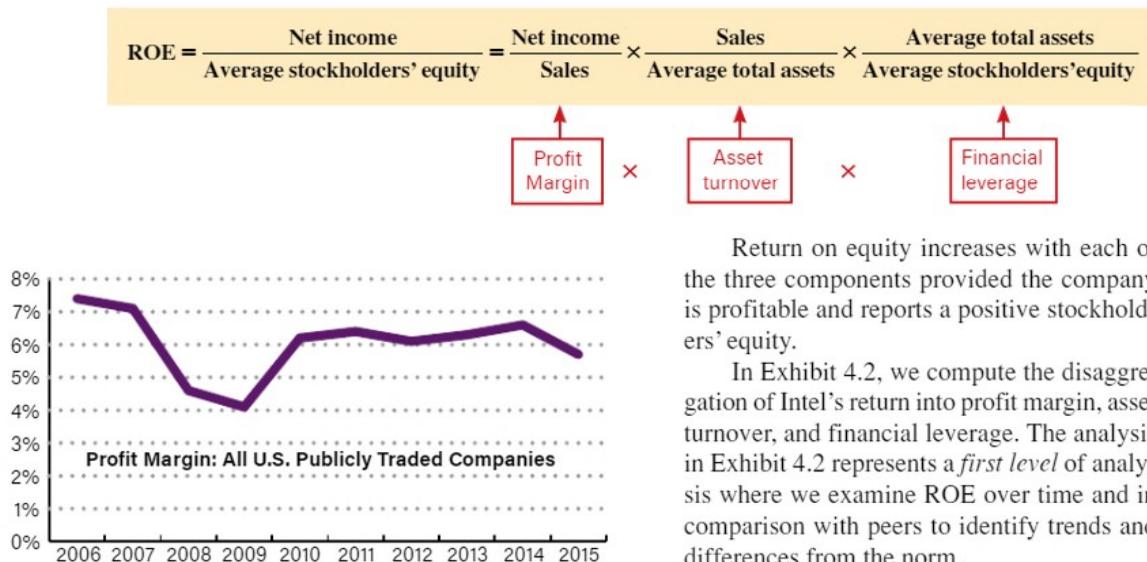
$$\frac{\$11,420 + [(\$105 - \$315) \times (1 - 37\%)]}{(\$103,065 + \$91,900) / 2} = 11.58$$

"Statutory tax rate" in the adjusted ROA formula is the federal statutory tax rate *plus* the state tax rate net of any federal tax benefits; we use the assumed 37% federal and state tax rates as explained in the NOPAT computation later in this module. This adjusted numerator better reflects the company's operating profit as it measures return on assets exclusive of financing costs (independent of the capital structure decision).

The goal is to increase the productivity of the company's assets in generating sales and then to bring as much of each sales dollar to the bottom line (net income). Managers usually understand product pricing, management of production costs, and control of overhead costs. Fewer managers understand the role of the balance sheet. The ROA approach to performance measurement encourages managers to focus on returns achieved from assets under their control, and ROA is maximized with a joint focus on both profitability and productivity.

Analysis of Profitability and Productivity

The complete DuPont return on equity disaggregation follows.



Return on equity increases with each of the three components provided the company is profitable and reports a positive stockholders' equity.

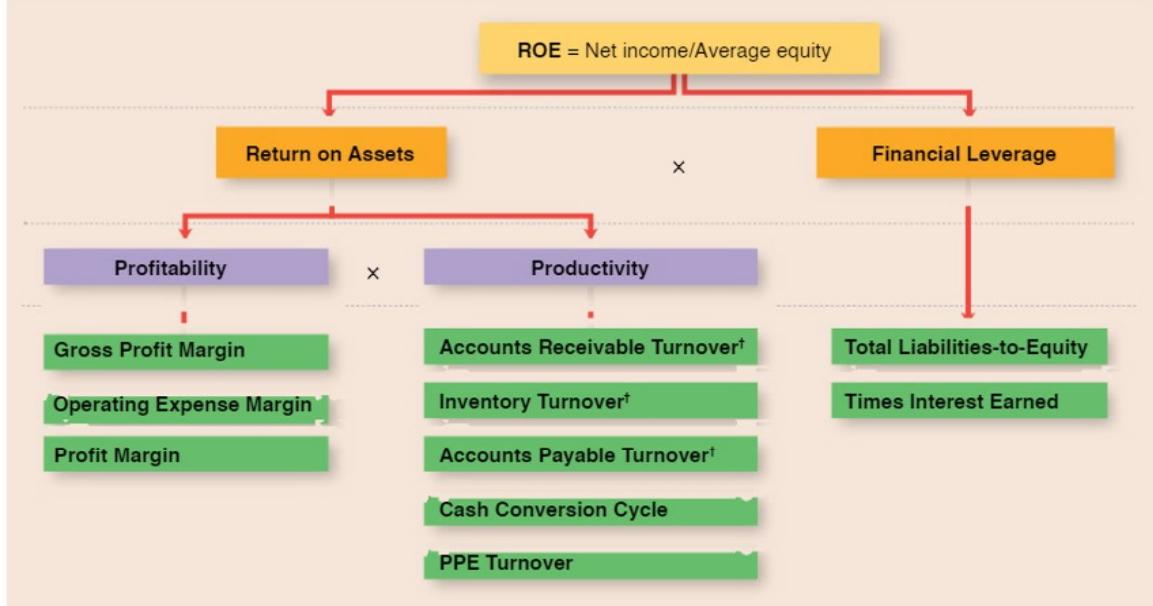
In Exhibit 4.2, we compute the disaggregation of Intel's return into profit margin, asset turnover, and financial leverage. The analysis in Exhibit 4.2 represents a *first level* of analysis where we examine ROE over time and in comparison with peers to identify trends and differences from the norm.

Exhibit 4.2 ■ Disaggregation of Intel's ROE (\$ millions)

Profit margin (PM)	$\frac{\text{Net income}}{\text{Sales}}$	$\frac{\$11,420}{\$55,355}$	=
×			×
Asset turnover (AT)	$\frac{\text{Sales}}{\text{Average total assets}}$	$\frac{\$55,355}{(\$103,065+\$91,900)/2}$	=
=			=
Return on assets (ROA)	$\frac{\text{Net income}}{\text{Average total assets}}$	$\frac{\$11,420}{(\$103,065+\$91,900)/2}$	=
×			×
Financial leverage (FL)	$\frac{\text{Average total assets}}{\text{Average stockholders' equity}}$	$\frac{(\$103,065 + \$91,900)/2}{(\$61,085 + \$55,865)/2}$	=
=			=
Return on equity (ROE)	$\frac{\text{Net income}}{\text{Average stockholders' equity}}$	$\frac{\$11,420}{(\$61,085 + \$55,865)/2}$	=

The *second level* analysis of the components of return on equity seeks to identify factors driving profitability (profit margin) and productivity (asset turnover) and to assess whether financial leverage increases the risk of default and bankruptcy beyond acceptable levels. The framework for second-level analysis is in Exhibit 4.3 and we explain each component in this module.

Exhibit 4.3 ■ DuPont Analysis of Return on Equity



[†]This metric is also commonly measured "in days"—see discussion below.

Analysis of Profitability

Profit margin (Net income/Sales) reflects the profit in each dollar of sales. For 2015, the median profit margin for all publicly traded companies was 5.7%. During 2006–2015, profit margin ranged from 7.4% (just prior to the recession) to 4.1% (when the recession was at its worst).

Profit margin, while an important measure of profitability, is influenced by *both* gross profit on sales and overhead expenses. Consequently, we gain insight into profitability by separately examining gross profit margin and the SG&A expense margin.

Gross Profit Margin

Gross profit margin (Gross profit/Sales) is influenced by *both* the selling price of a company's products and the cost to make or buy those products. For 2015, the median gross profit margin for all publicly traded companies was 40.5% and it has trended upward over the past 10 years. Gross profit margins differ greatly by industry and depend on a company's specific business model. Consequently, we must be careful in identifying peers for benchmarking to make sure their business models are similar.

We generally prefer gross profit margin to be high and increasing as the opposite usually signals more competition and/or less appeal for the company's product line. When analyzing gross profit margin, it is often helpful to view it on a unit basis, that is, as gross profit for one product unit. If, for example, we purchase a product for \$6 and sell it for \$10, gross profit margin is 40% ($[\$10 - \$6]/\$10$). A decline in gross profit margin, then, signals that the spread between the cost to make or buy the product and its selling price has narrowed. This narrowing could be due to several possible reasons, all of which warrant investigation.

- Perhaps competitive intensity increased and selling prices have dropped to remain competitive.
- Perhaps the company's product line has lost appeal or its technology is not cutting edge.
- Perhaps the cost to make or buy products has increased due to increases in material or labor costs and the company cannot pass on that cost increase to customers.
- Perhaps there is a change in product mix away from high margin products to lower margin products (remember that sales and gross profit includes *all* of the company's products, including both high margin and low margin products).

- Perhaps the volume of products sold has declined, resulting in an increase in manufacturing cost as factory overhead is spread out over a smaller number of units produced).

It is not enough for our analysis to reveal that a company's gross profit margin has increased or decreased. Instead, we must uncover the *reasons* for the change. It is only with analysis of the underlying cost and pricing structure of a company's products that we are able to predict future levels of gross profit. Many believe that a serious analysis should focus on the *individual product* level and the costs to make or buy those products along with the pricing strategy for the different markets served. That level of granularity is important for effective analysis of gross profit margin.

Operating Expense Margin

The operating expense margin, also referred to as SG&A expense margin (SG&A expense/Sales), measures general operating costs for each sales dollar. These costs include all costs other than those to make or buy the company's products. For 2015, the SG&A expense margin for all publicly traded companies was 21.9% and that margin has remained fairly steady since the economy emerged from recession in 2009.

Analysis of operating expense margin focuses on each expense in whatever detail the company provides in its income statement. We compare the operating expense margin, and the margins for each of its components, over time and against peers (making sure that peers have similar business models). We investigate deviations from historical trends or benchmarks to uncover the cause. We are inclined to judge lower expense levels as favorable, but caution is advised. Perhaps the company has tried to mitigate declining profits by reducing R&D, marketing, or compensation costs. Such activities tend to result in short-term improvements at long-term costs such as reduced market share and damaged employee morale.

Analysis of Productivity

Productivity is reflected in return on assets via turnover of total assets (Sales/Total assets). While a useful measure to gauge overall trend, a more rigorous analysis examines the productivity of each major asset category.

Analysis of Working Capital Components

All turnover ratios have sales (or cost of sales) in the numerator and a balance sheet item in the denominator. The accounts receivable turnover, for example, is Sales/Average accounts receivable (sales is matched with receivables as both are based on selling prices). The inventory turnover is COGS/Average inventories (here we match COGS with inventories as both reflect the cost to make or buy products).

Turnover, while widely reported, has limited usefulness. For example, it is not easy to see how much cash is generated if accounts receivable turnover improves. It is more intuitive to think of the average number of days to collect accounts receivable, the average number of days to sell inventory, or the average number of days to pay accounts payable. Accordingly, a good analysis computes the "days" measures for working capital accounts. Common measures based on days follow.

Ratio	Computation
Days sales outstanding	365 × Average accounts receivable/Sales
+ Days inventory outstanding	365 × Average inventory/COGS
- Days payables outstanding.....	365 × Average accounts payable/COGS
= Cash conversion cycle	AR days + Inventory days - AP days*

*AP refers to accounts payable, and AR refers to accounts receivable.

Cash Conversion Cycle

The three measures from the table above can be combined to yield the **cash conversion cycle** (Days sales outstanding + Days inventory outstanding - Days payables outstanding). The cash conversion cycle measures the average time (in days) to sell inventories, collect the receivables from the sale, pay

the payables incurred for the inventory purchase, and return to cash. This is the same cash conversion cycle we describe in Module 2 (we use the term “operating cycle” in Exhibit 2.4 to describe the same concept). Each time a company completes one cash conversion cycle, it generates profit and cash flow. Managers aim to shorten the cash conversion cycle.

The median cash conversion cycle for all publicly traded companies was 62 days in 2015 and has remained fairly constant since the economy emerged from recession (during recession the average cash conversion cycle rose to 66 days).

Cash conversion cycle depends on the business model of the company, which dictates:

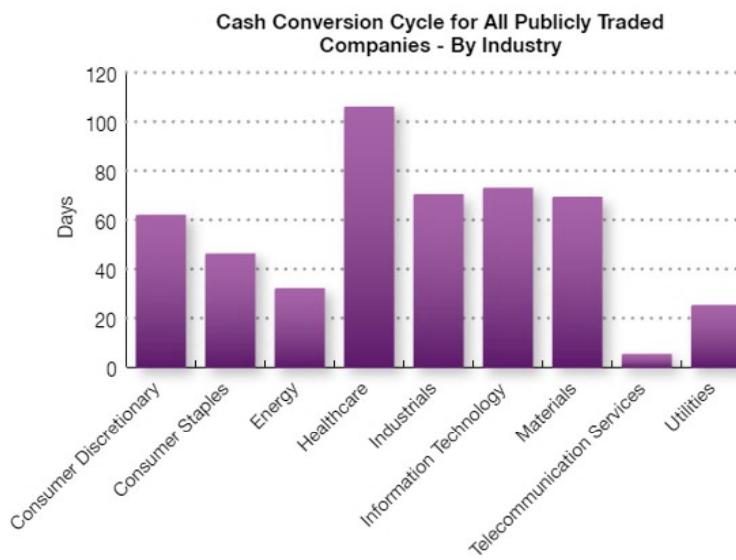
- Credit terms offered to customers.
- Types of inventory carried and depth and breadth of product lines (which influence the time inventories remain unsold).
- Time period in which suppliers are paid for goods and services.

Diversity across business models is evident in the following graphic for medians of the cash conversion cycle for selected industries in 2015.

The variability in the cash conversion cycle across industries reflects fundamental differences in business models. Cash conversion cycle for the healthcare industry, for example, is much longer as a result of the extended period of time to collect receivables from third-party payers such as insurance companies and the government. In contrast, the telecommunications services industry’s quick cash conversion results from lower levels of inventory, and rapid collection of receivables from customers who typically pay their phone bill within a month.

Generally companies prefer a lower cash conversion cycle. This means that the operating cycle is generating profit and cash flow quickly. Our analysis of this measure focuses on trends over time and comparisons to peers (with similar business models).

Sometimes, companies have a *negative* cash conversion cycle. [Apple](#)’s 2015 cash conversion cycle is one example.



Days sales outstanding	26.7
+ Days inventory outstanding	5.8
- Days payables outstanding	85.2
= Cash conversion cycle	(52.7)

Apple carries little inventory as its products are pre-sold and shipped when manufactured. Consequently, its quick sale of inventory and relatively longer time to pay suppliers results in a negative cash conversion cycle of (52.7) days. The negative number means that Apple is able to invest the cash it receives from the sale of its products for 52.7 days on average before that cash is needed to pay suppliers. This allows Apple to generate both profit from the sale *and* profit from investing cash. A negative cash conversion cycle is generally viewed positively.

A good analysis includes a review of cash conversion cycle over time. **Merck & Co.**, for example, reports improvement in its cash conversion cycle over the 2013–2015 period.

Amounts in Days	2015	2014	2013
Days sales outstanding	60.6	59.7	61.6
+ Days inventory outstanding	125.5	128.4	137.4
- Days payables outstanding	<u>63.0</u>	<u>53.3</u>	<u>43.3</u>
= Cash conversion cycle.....	123.1	134.8	155.7

The improvement in Merck's cash conversion cycle reflects improvement in two of the three working capital accounts.

- It is collecting receivables a bit more slowly (this is not an improvement).
- It is selling inventories faster (an improvement).
- It is delaying payment on payables (an improvement).

Two of the three generated additional cash during the period. To compute the amount of cash generated (or used) by changes in each of the measures, multiply the change in the AR measure by sales per day (Sales/365) and the change in the inventory and AP measures by COGS per day (COGS/365), as follows.

\$ millions	Amounts in Days			Sales (or COGS) per day	Cash savings
	2015	2014	Change		
Days sales outstanding	60.6	59.7	(0.9)	× \$108.2	= \$(97.4)
+ Days inventory outstanding	125.5	128.4	2.9	× 40.9	= 118.6
- Days payables outstanding	<u>63.0</u>	<u>53.3</u>	9.7	× 40.9	= 396.7
= Cash conversion cycle	123.1	134.8			\$417.9

In 2015, Merck's sales per day were \$108.2 million and COGS per day were \$40.9 million. Collecting receivables 0.9 days later reduced Merck's cash balance by \$97.4 million ($\108.2×0.9). Larger improvements came from selling inventory more quickly and delaying payment to suppliers. These actions generated \$118.6 million and \$396.7 million, respectively.

Although these trends for Merck are favorable, we must investigate whether they are *too* favorable. Companies can generate cash by restricting credit policies, by reducing the depth and breadth of their product offerings, and by delaying payment to suppliers ("leaning on the trade"). All of these actions can generate a short-term inflow of cash at a longer-term cost of market position and supplier relations. These questions must be answered by a review of non-financial information in the MD&A section of the 10-K, listening to conference calls with management (on the Investor Relations portion of a company's website), reading the financial press, and reviewing analysts' reports.

Analysis of Plant, Property and Equipment (PPE)

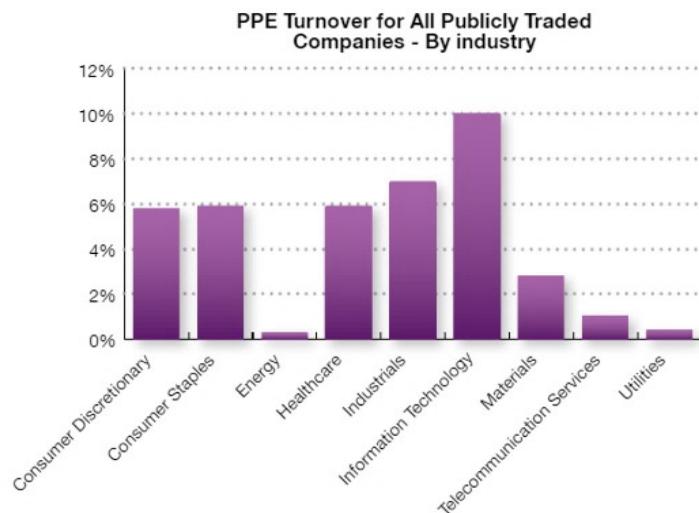
The asset class for which analysis of turnover is most useful is PPE assets (Sales/Average PPE assets). Lower levels of PPE turnover indicate a higher level of capital intensity. PPE asset turnover differs by industry as revealed in the graph for 2015 shown below for publicly traded companies. The energy, telecommunications, and utilities industries require high levels of capital investment and, consequently, report low plant asset turnover.

Because investment in PPE assets is often a large part of the balance sheet, improvement in plant asset turnover can greatly impact the company's return on assets and cash flow. Improvements in PPE turnover are not easy to achieve, however, often requiring:

- Divestiture of unproductive assets or entire business segments.
- Joint ventures with other companies to jointly use PPE assets such as distribution networks, information technology, production facilities, and warehouses.

- Divestiture of production facilities with agreements to purchase finished goods from the facilities' new owners.
- Sale and leaseback of administrative buildings.

Each of these activities is a strategic and financial event, often requiring integration within the supply chain, new financing, and relationship building. As such, improvements in PPE turnover can be difficult to achieve. If properly structured, however, they can markedly increase asset returns and cash flow.



Analysis of Financial Leverage

As companies utilize a larger proportion of borrowed money in their capital structures, they incur obligations for interest payments and the repayment of the amount borrowed (the principal). Those obligations are typically evidenced by a loan agreement (or bond indenture) that contains some or all of the following.

- Restrictions on certain activities, such as mergers or acquisitions of other companies without approval of lenders.
- Prohibitions against dividend payments or the repurchase of common stock without approval of lenders.
- Covenants to maintain required levels of financial ratios, such as a maximum level of financial leverage, minimum levels of the current and quick ratios, minimum level of equity, and minimum level of working capital.
- Prohibitions against the pledging of assets to secure new borrowings.
- Remedies to lenders in event of default (failure to make required interest and principal payments when due). These remedies can include seizing company assets or, possibly, forcing the company into bankruptcy and requiring liquidation.

Judicious use of financial leverage is beneficial to stockholders (it is a relatively inexpensive source of capital), but the use of borrowed money adds risk as debt payments are contractual obligations. Analysis typically involves ratios that investigate the *level* of borrowed money relative to equity capital and the level of profitability and *cash flow* relative to required debt payments. Although there are dozens of financial leverage-related ratios in commercial databases, the following two ratios capture the spirit of such analysis.

- Total liabilities-to-equity ratio (Total liabilities/Stockholders' equity).
- Times interest earned ratio (Earnings before interest and taxes/Interest expense).

As for all ratios, analysis of financial leverage ratios must consider ratios over time and comparisons with peers. Appropriate financial leverage varies across industries because different business models generate cash flow streams that differ in amount and variability over time. Generally, business models that generate high and stable levels of cash flow can support a higher level of debt.

The median total liabilities-to-equity ratio for all publicly traded companies in 2015 was 0.71, indicating that companies typically borrow money, but have more equity than borrowed money in their capital structures. Financial leverage ratios differ by industry and company size. The median financial leverage ratio for the S&P 500 companies, for example, was 2.74 in 2015 and ranged from 2.4 to 2.7 over the 2011–2015 period.

Exhibit 4.4 shows a summary of ratios used in the DuPont disaggregation of return on equity.

Exhibit 4.4 ■ Summary of Ratios in DuPont Disaggregation of Return on Equity

Ratio	Computation	What The Ratio Measures	Positive Indicators Include
Return on equity	Net income + Avg. stockholders' equity, or Return on assets × Financial leverage	ROE measures accounting return to shareholders using net income and the book value of stockholders' equity.	<ul style="list-style-type: none"> ▪ Improvement over time and favorable comparison to peers. ▪ Greater proportion of ROE from ROA (operations) than financial leverage (risk).
Return on assets	Net income/Avg. total assets or Profit margin × Asset turnover	ROA measures the accounting return on total assets using net income and total assets.	<ul style="list-style-type: none"> ▪ Improvement over time in both profit margin and asset turnover. ▪ Improvement in gross margins and not solely from expense reduction.
PROFITABILITY			
Gross profit margin	Gross profit / Sales	Gross profit measures the difference between selling price and the cost to make or buy the products sold for the year.	<ul style="list-style-type: none"> ▪ Improvement over time due to increases in selling prices and/or reductions in cost to make or buy without compromising product quality. ▪ Favorable comparison to peers.
Operating expense margin (or SG&A expense margin)	SG&A expense / Sales	Operating expense margin measures total overhead expense (SG&A) as a percent of sales.	<ul style="list-style-type: none"> ▪ Improvement over time. ▪ Favorable comparison to peers. ▪ No short-term gains at long-term cost (such as unusual reductions in marketing and R&D expenses).
Profit margin (or net profit margin)	Net income / Sales	Profit margin includes effects of both gross profit margin, the operating expense margin, and net nonoperating expenses.	<ul style="list-style-type: none"> ▪ Improvement over time. ▪ Favorable comparison to peers.
PRODUCTIVITY			
Accounts receivable turnover	COGS / Avg. inventory	AR turnover reflects how effective a company manages the credit issued to customers.	<ul style="list-style-type: none"> ▪ Improvement over time. ▪ Favorable comparison to peers.
Days sales outstanding (DSO)	365 × (Avg. accounts receivable / Sales)	DSO reflects how well a company's accounts receivables are managed.	<ul style="list-style-type: none"> ▪ Maintain sales while reducing days to collect receivables.
Inventory turnover	COGS / Avg. inventory	Inventory turnover reflects the number of times inventory is sold or used during the period.	<ul style="list-style-type: none"> ▪ Improvement over time. ▪ Favorable comparison to peers.
Days inventory outstanding (DIO)	365 × Avg. inventory/COGS	DIO reflects how many days it takes for a company to sell its inventory.	<ul style="list-style-type: none"> ▪ Maintain sales while reducing days to sell inventory.
Accounts payable turnover	COGS + Avg. accounts payable	AP turnover reflects how many times a company pays off its suppliers during the period.	<ul style="list-style-type: none"> ▪ Improvement over time. ▪ Favorable comparison to peers.
Days payables outstanding (DPO)	365 × (Avg. accounts payable/COGS)	DPO reflects how long it takes a company to pay its invoices from suppliers.	<ul style="list-style-type: none"> ▪ Maintain supplier relations while delaying payment to suppliers.
Cash conversion cycle	AR days + Inv days – AP days	Cash conversion (operating) cycle measures the days to convert cash to inventories, receivables to cash, cash to payables.	<ul style="list-style-type: none"> ▪ Improvement over time. ▪ Favorable comparison to peers.
PPE turnover	Sales / Avg. PPE assets	Plant asset turnover is a productivity measure, comparing the volume of sales generated by plant assets.	<ul style="list-style-type: none"> ▪ Improvement over time. ▪ Favorable comparison to peers.

continued

Exhibit 4.4 ■ (continued)

Ratio	Computation	What The Ratio Measures	Positive Indicators Include
FINANCIAL LEVERAGE			
Total liabilities-to-equity	Total liabilities + Stockholders' equity	Proportion of liabilities vs. equity in the capital structure.	<ul style="list-style-type: none"> Improvement over time. Favorable comparison to peers. Relatively lower levels are preferable.
Times interest earned	Earnings before interest and taxes + Interest expense, gross	Pool of operating profit before tax that a company earns relative to its interest expense, gross.	<ul style="list-style-type: none"> Improvement over time. Favorable comparison to peers. Higher levels are preferable to lower levels.

LO3 Review 4-3

Refer to the income statement and balance sheet data for **Cisco Systems Inc.** from Review 4-1 along with the following additional information.



\$ millions	Jul. 25, 2015	Jul. 26, 2014
Cost of sales.....	\$19,480	\$19,373
Accounts receivable.....	5,344	5,157
Inventories	1,627	1,591
Accounts payable.....	1,104	1,032
Liabilities.....	53,774	48,409

Required

- Disaggregate 2015 ROA into components of profitability margin (PM) and asset turnover (AT). Then, prove that their product (multiplication) results in ROA.
- Compute the gross profit margin.
- Compute the cash conversion cycle.
- Compute the total liabilities-to-equity ratio.

Solution on p. 4-64.

Operating Focus on Financial Condition

ROE disaggregation with an *operating focus* recognizes that companies create value mainly through core operations of the business. Operating activities involve the manufacturing and selling of company products and services to customers.

The balance sheet and income statement include *both* operating and nonoperating items. Intel's balance sheet, for example, includes operating assets and liabilities such as accounts receivable, inventories, plant assets, accounts payable, and accrued liabilities. Intel's balance sheet also includes assets and liabilities that are not related to core operations. These nonoperating items include short-term investments, long-term marketable equity securities, and short-term and long-term debt. Intel's income statement includes revenues and operating expenses such as COGS and SG&A, which relate directly to operations. The income statement also includes nonoperating items such as interest income and expense, dividend income, and gains and losses on sale of securities.



Operating and Nonoperating Returns Return on assets, computed using net income and total assets, reflects a blend of the return on a company's operating assets (its operating profit divided by its operating assets) and its nonoperating return. Accordingly, analysis of a company can be improved if we separately identify the operating and nonoperating components of the business and their separate returns. More specifically:

ROE = Operating return + Nonoperating return

This shows that ROE consists of two returns: (1) return from the company's operating activities, linked to revenues and expenses from the company's products or services, and (2) return from financing and investing (nonoperating) activities. Companies can use debt to increase their return on equity, but this increases risk because the failure to make required debt payments can yield many legal consequences, including bankruptcy. This is one reason why many top investors such as Warren Buffett focus on acquiring companies whose return on equity is derived primarily from operating activities.

Operating and Nonoperating Liabilities A second, more subtle, issue arises in computing return on equity. In the traditional DuPont analysis, ROE is the product of the return on assets and financial leverage. Financial leverage is the ratio of total assets to stockholders' equity, which increases as the proportion of debt increases relative to equity. The problem is that the "debt" used in this computation includes *all* of the company's debt. However, there is a difference between borrowed money and operating liabilities such as accounts payable and accrued liabilities. Accounts payable and accruals are interest free and are *self-liquidating*, meaning that they are paid when receivables are collected as part of the cash conversion cycle. On the other hand, borrowed money is interest-bearing and often contains severe legal repercussions in the event of non-payment, possibly risking bankruptcy of the company. The operating focus treats these two types of debt differently for ROE analysis, recognizing the interest-free, self-liquidating character of operating liabilities and separately treating borrowed money as a nonoperating activity.

ALERT The FASB released a draft of a proposed new format for financial statements to, among other things, distinguish operating and nonoperating activities.

Return on Net Operating Assets (RNOA)

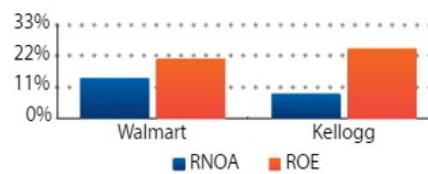
Operating returns are reflected in the **return on net operating assets (RNOA)**, defined as follows.

$$RNOA = \frac{\text{Net operating profit after tax (NOPAT)}}{\text{Average net operating assets (NOA)}}$$

To implement this formula, we must first classify the balance sheet and income statement into operating and nonoperating components so that we can assess each separately. We first consider operating activities on the balance sheet and explain how to compute NOA. Second, we consider operating activities on the income statement and explain how to compute NOPAT.

Business Insight ■ ROE and RNOA

The following graph shows the ROE and RNOA for **Kellogg** and **Walmart**, two companies that report a healthy ROE in the 20%–25% range. The RNOA for each company is markedly different. About 67% of Walmart's ROE comes from operations ($14\%/21\% = 67\%$) whereas for Kellogg that proportion is only 32% ($8\%/25\% = 32\%$) and its nonoperating returns make up a much greater proportion of total ROE.



Net Operating Assets (NOA)

RNOA relates net operating profit after tax (NOPAT) to the average net operating assets (NOA) of the company. We compute NOA as follows.

$$\text{Net operating assets} = \text{Operating assets} - \text{Operating liabilities}$$

To compute NOA we must partition the balance sheet into operating and nonoperating items. Exhibit 4.5 shows a typical balance sheet and highlights the operating items, in red boldface.

Exhibit 4.5 ■ Operating and Nonoperating Items in the Balance Sheet

Typical Balance Sheet Operating Items Highlighted in Red	
Current Assets	Current Liabilities
Cash and cash equivalents	Short-term notes and interest payable
Short-term investments	Current maturities of long-term debt
Accounts receivable	Dividends payable
Inventories	Accounts payable
Prepaid expenses	Accrued liabilities
Deferred income tax assets	Unearned (deferred) revenue
Other current assets	Deferred income tax liabilities
Current assets of discontinued operations	Current liabilities of discontinued operations
Loans receivable	
Long-Term Assets	Long-Term Liabilities
Long-term investments in securities	Bonds and notes payable
Property, plant and equipment, net	Capitalized lease obligations
Capitalized lease assets	Pension and other post-employment liabilities
Natural resources	Deferred income tax liabilities
Equity method investments	Long-term liabilities of discontinued operations
Goodwill and intangible assets	Derivative liabilities
Deferred income tax assets	
Other long-term assets	
Long-term assets of discontinued operations	
Derivative assets	
	Stockholders' Equity
	All equity accounts
	Noncontrolling interest

Operating Assets

Operating assets are those assets directly linked to operating activities, the company's ongoing (continuing) business operations. They typically include receivables; inventories; prepaid expenses; property, plant, and equipment (PPE); and capitalized lease assets. Operating assets are those the company needs to operate normally, and those assets can be purchased outright or leased. Leasing is a way to acquire an asset for use without the upfront cash outlay. If the leased asset is used for operations, then it is an operating asset and we categorize it as such *regardless* of how it was financed.

Operating assets *exclude* short-term and long-term investments in marketable securities. However, companies sometimes purchase equity interests in other companies for strategic purposes. For example, a company might buy the stock of its major supplier or transporter to secure the supply chain. Or a company might take an equity position in another company as a prelude to an acquisition. Such ownership positions usually involve a significant percentage of the outstanding common stock (20% or more). Or a company might enter into a joint venture (JV) or form an alliance with a strategic partner to share resources or risk. Because such investments are strategic and represent part of the ongoing, ordinary operating activities of a company, we categorize them as operating assets.

Intangible assets and goodwill result from mergers with, or acquisitions of, other companies. These deals have the effect of the acquirer buying a collection of operating assets (including operating liabilities). Accordingly, all intangible assets and goodwill are operating assets and we categorize them as such.

Deferred tax assets (and liabilities) are operating items because they most often relate to future tax deductions (or payments) arising from operating activities. We assume that "other" assets and liabilities, and "other" revenues and expenses, are operating unless information suggests otherwise. For example, details in footnotes might reveal that "other" includes nonoperating items. Or the company might explicitly indicate the "other" is nonoperating by reporting the item after a subtotal for income from operations. In these cases, we would consider the "other" as nonoperating.

Operating Liabilities

Operating liabilities are liabilities that arise from operating revenues and expenses. For example, accounts payable and accrued expenses help fund inventories, wages, utilities, and other operating expenses. Unearned revenue is part of operating liabilities because it relates to operating revenue. Similarly, pension and other post-employment obligations relate to long-term obligations for employee retirement and health care, which by definition are operating activities.

Nonoperating Assets

Nonoperating assets include cash and cash equivalents (see Business Insight box on page 4-19) and investments in marketable securities, both short- and long-term. These investments can take many forms. Some companies invest in marketable equity securities to earn a return in the form of dividends and price appreciation. Companies might also purchase bonds or other debt instruments issued by other companies and organizations for interest income and price appreciation. These investments represent nonoperating assets.

We treat all marketable equity and debt investments as nonoperating regardless of whether those non-strategic investments appear on the balance sheet as current or long-term assets.

Sometimes companies make loans to customers, suppliers, or other parties, and we categorize such non-core (receivable) assets as nonoperating. (Note: For financial services companies such as banks and insurance firms, debt and equity securities along with loans and notes to customers, are part of normal operations and are categorized as operating assets; but for non-financial companies such as retailers, manufacturers, and service providers, these items are apart from ordinary operating activities and represent nonoperating assets.)

We categorize assets (and liabilities) from discontinued operations as nonoperating as they represent assets and liabilities that will be sold to another party due to a reorganization or spin-off. Many companies separately disclose discontinued assets (and liabilities) on the balance sheet to distinguish them from continuing net assets. If the discontinued items are not separated on the balance sheet, the footnotes provide details to facilitate a disaggregated analysis. Similarly, assets and liabilities “held for sale” are categorized as nonoperating because the company has formally decided to sell them to another party.

Nonoperating Liabilities

Nonoperating liabilities include all interest-bearing debt, both short- and long-term. This is the case irrespective of whether the debt relates to the purchase of a specific asset, like a mortgage on a building or a loan on equipment. The purpose of the debt does *not* affect its categorization: interest-bearing debt, whether short-term or long-term, whether tied to an operating asset or not, is always categorized as nonoperating.

Lease liabilities are treated as *nonoperating*. Leases are another form of borrowing where a specific asset is acquired for use in exchange for future lease payments. Simply put, leases are like collateralized loans. Accordingly, lease liabilities are categorized exactly as all loans, as *nonoperating*. (Note that lease assets are categorized as operating while lease liabilities are categorized as nonoperating.)

Companies use derivatives (including futures, forward contracts, options, swaps and other financial securities) to hedge (mitigate) risk or to speculate. Derivatives are reported on balance sheets as liabilities or assets, and sometimes both. For analysis purposes, all derivatives are nonoperating items. Admittedly, some derivative positions are operating assets or liabilities; for example, a forward contract on a company’s manufacturing raw materials. Other derivatives are clearly nonoperating; for example, an interest rate swap. However, distinguishing between the two is complicated and often impossible for an external analyst. Accordingly, we treat all derivatives as nonoperating, both assets and liabilities.

To summarize, operating assets and liabilities relate to the company’s core activities, those required to deliver a company’s products or services to its customers. Nonoperating assets and liabilities relate to financing, non-core investing activities, and discontinued operations. (Admittedly, analysts do not all agree on the operating versus nonoperating classification of some assets and liabilities, and we highlight those as we encounter them.)

Exhibit 4.6 shows how a balance sheet can be reorganized into operating and nonoperating items.

Net nonoperating obligations are total nonoperating liabilities less total nonoperating assets. The accounting equation stipulates that $\text{Assets} = \text{Liabilities} + \text{Equity}$, so we can adjust it to yield the following key identity:

$$\text{Net operating assets (NOA)} = \text{Net nonoperating obligations (NNO)} + \text{Stockholders' equity (EQ)}$$

Exhibit 4.6 ■ Balance Sheet Distinguishing Between Operating and Nonoperating Items

	Assets	Liabilities
Net operating assets (NOA)..... [Oper. assets - Oper. liabilities]	Current operating assets + Long-term operating assets = Total operating assets	Current operating liabilities + Long-term operating liabilities = Total operating liabilities
Net nonoperating obligations (NNO).... [Nonoper. liabilities - Nonoper. assets]	Current nonoperating assets + Long-term nonoperating assets = Total nonoperating assets	Current nonoperating liabilities + Long-term nonoperating liabilities = Total nonoperating liabilities
Equity (NOA - NNO)	Total assets	Equity Stockholders' equity (EQ) Total liabilities and equity

The following are Intel's balance sheets for 2015 and 2014, with operating assets and operating liabilities in red boldface.

\$ millions	INTEL CORP. Balance Sheets	
	Dec. 26, 2015	Dec. 27, 2014
Assets		
Current assets		
Cash and cash equivalents	\$ 15,308	\$ 2,561
Short-term investments	2,682	2,430
Trading assets	7,323	9,063
Accounts receivable, net	4,787	4,427
Inventories	5,167	4,273
Deferred tax assets	2,036	1,958
Other current assets	3,053	3,018
Total current assets	40,356	27,730
Property, plant and equipment, net.....	31,858	33,238
Marketable equity securities	5,960	7,097
Other long-term investments	1,891	2,023
Goodwill.....	11,332	10,861
Identified intangible assets, net	3,933	4,446
Other long-term assets	7,735	6,505
Total assets.....	\$103,065	\$91,900
Liabilities and stockholders' equity		
Current liabilities		
Short-term debt	\$ 2,634	\$ 1,596
Accounts payable.....	2,063	2,748
Accrued compensation and benefits	3,138	3,475
Accrued advertising.....	960	1,092
Deferred income	2,188	2,205
Other accrued liabilities	4,684	4,895
Total current liabilities	15,667	16,011
Long-term debt*	20,933	12,971
Long-term deferred tax liabilities.....	2,539	3,775
Other long-term liabilities.....	2,841	3,278
Stockholders' equity		
Common stock and capital in excess of par value	23,411	21,781
Accumulated other comprehensive income.....	60	666
Retained earnings.....	37,614	33,418
Total stockholders' equity	61,085	55,865
Total liabilities, temporary equity, and stockholders' equity	\$103,065	\$91,900

* Included in Intel's long-term total debt is \$897 million (2015) and \$912 million (2014) of convertible debentures that Intel classifies as "temporary equity."

We assume that Intel's "other" assets and liabilities are operating. We can sometimes make a finer distinction if footnotes to financial statements provide additional information. For now, assume that these "other" items reported in balance sheets pertain to operations.

Using Intel's highlighted balance sheet above, we compute net operating assets for 2015 and 2014 as follows (recall that Net operating assets (NOA) = Total operating assets – Total operating liabilities).

Intel's Net Operating Assets (\$ millions)	Dec. 26, 2015	Dec. 27, 2014
Operating assets		
Accounts receivable, net	\$ 4,787	\$ 4,427
Inventories	5,167	4,273
Deferred tax assets	2,036	1,958
Other current assets	3,053	3,018
Property, plant, and equipment, net	31,858	33,238
Goodwill	11,332	10,861
Identified intangible assets, net	3,933	4,446
Other long-term assets	7,735	6,505
Total operating assets	\$69,901	\$68,726
Operating liabilities		
Accounts payable	\$ 2,063	\$ 2,748
Accrued compensation and benefits	3,138	3,475
Accrued advertising	960	1,092
Deferred income	2,188	2,205
Other accrued liabilities	4,684	4,895
Long-term deferred tax liabilities	2,539	3,775
Other long-term liabilities	2,841	3,278
Total operating liabilities	\$18,413	\$ 21,468
Net operating assets (NOA)	<u>\$51,488</u>	<u>\$ 47,258</u>

Business Insight ■ Why Is Cash a Nonoperating Asset?

Most analysts consider cash as nonoperating because this account consists almost totally of "cash equivalents," which are short-term investments with a scheduled maturity of 90 days or less. Technically, the amount of cash needed to support routine business transactions is considered as operating and the remainder as a nonoperating short-term investment, similar to investments reported as marketable securities. If we know what portion of the cash balance supports operating activities, we would classify that as operating. Unfortunately, companies do not report that information and most analysts feel that it is probably a small portion. As a result, we, like others, treat the entire cash and cash equivalents balance as nonoperating and recognize that we are probably understating net operating assets slightly.

Review 4-4 LO4



Refer to the following balance sheet for **Cisco Systems Inc.** Hint: Financing receivables at Cisco Systems are part of ongoing operations and should be classified as operating assets.

\$ millions	July 25, 2015	July 26, 2014
Assets		
Cash and cash equivalents	\$ 6,877	\$ 6,726
Investments	53,539	45,348
Accounts receivable, net	5,344	5,157
Inventories	1,627	1,591
Financing receivables, net	4,491	4,153
Deferred tax assets	2,915	2,808
Other current assets	1,490	1,331
Total current assets	76,283	67,114

continued

\$ millions (continued)	July 25, 2015	July 26, 2014
Property and equipment, net	3,332	3,252
Financing receivables, net	3,858	3,918
Goodwill	24,469	24,239
Purchased intangible assets, net	2,376	3,280
Other assets	<u>3,163</u>	<u>3,267</u>
Total assets	<u><u>\$113,481</u></u>	<u><u>\$105,070</u></u>
Liabilities		
Short-term debt	\$□□3,897	\$□□□ 508
Accounts payable	1,104	1,032
Income taxes payable	62	159
Accrued compensation	3,049	3,181
Deferred revenue	9,824	9,478
Other current liabilities	<u>5,687</u>	<u>5,451</u>
Total current liabilities	23,623	19,809
Long-term debt	21,457	20,337
Income taxes payable	1,876	1,851
Deferred revenue	5,359	4,664
Other long-term liabilities	<u>1,459</u>	<u>1,748</u>
Total liabilities	<u>53,774</u>	<u>48,409</u>
Equity		
Common stock and additional paid-in capital	43,592	41,884
Retained earnings	16,045	14,093
Accumulated other comprehensive income	<u>61</u>	<u>677</u>
Total Cisco shareholders' equity	59,698	56,654
Noncontrolling interests	9	7
Total equity	<u>59,707</u>	<u>56,661</u>
Total liabilities and shareholders' equity	<u><u>\$113,481</u></u>	<u><u>\$105,070</u></u>

Required

- Determine operating assets and operating liabilities for fiscal-year-end 2014 and 2015.
- Compute net operating assets (NOA) for fiscal-year-end 2014 and 2015.

Solution on p. 4-64.

Operating Focus on Financial Performance

The income statement reports both operating and nonoperating activities. Exhibit 4.7 shows a typical income statement with the operating activities in red boldface.

Operating Line Items Operating activities are those that relate to bringing a company's products or services to market and any after-sales support. The income statement in Exhibit 4.7 reflects operating activities through revenues, costs of goods sold (COGS), and other expenses. Selling, general, and administrative expense (SG&A) includes wages, advertising, occupancy, insurance, and many other operating expenses the company incurs in the ordinary course of business (some of these are often reported as separate line items in the income statement). Other common operating expenses include depreciation and amortization, restructuring, and research and development expenses. Companies also dispose of operating assets, and can realize gains or losses from their disposal, or write them off partially or completely when they become impaired. These, too, are operating activities. Finally, the reported tax expense on the income statement reflects both operating and nonoperating activities, which explains its mix of "red" and "black" colors. Later in this section we use Intel's income statement to explain how to separately compute tax expense related to operating activities only.

Nonoperating Line Items Nonoperating activities relate to borrowed money that creates interest expense. Nonoperating activities also relate to investments such as marketable securities and other investments that yield interest or dividend revenue and capital gains or losses from any sales of



nonoperating investments during the period. Often companies report income or loss from subsidiaries or business segments that the board of directors has formally decided to divest. Companies must report these “discontinued operations” on a separate line, below income from continuing operations. The line item includes the net income or loss from discontinued operations along with any gains or losses on the disposal of discontinued net assets. We consider discontinued operations as a nonoperating item on the income statement. For most companies, nonoperating activities yield a net nonoperating *expense*—interest expense usually exceeds interest and other income. When the reverse is true (interest and other income is greater than interest expense), then the net nonoperating item is a *revenue*.

Exhibit 4.7 ■ Operating and Nonoperating Items in the Income Statement

Typical Income Statement Operating Items Highlighted in Red
Revenues
Cost of sales
Gross profit
Operating expenses
Selling, general and administrative
Depreciation and amortization expense
Restructuring expense
Research and development
Asset impairment expense
Gains and losses on asset disposal
Total operating expenses
Operating income
Interest expense
Interest and dividend revenue
Investment gains and losses
Income from equity method investments
Total nonoperating expenses
Income from continuing operations before taxes
Tax expense
Income from continuing operations
Income (loss) from discontinued operations, net of tax
Consolidated net income
Less: consolidated net income attributable to noncontrolling interest
Consolidated net income attributable to controlling interest (parent company stockholders)

Distinguishing between Operating and Nonoperating Line Items Following are Intel’s 2013–2015 income statements with the operating items in red boldface. Intel’s operating items include sales, cost of sales, R&D, marketing, general and administrative, restructuring and amortization. Intel’s pretax operating income is \$14,002 million. Intel’s nonoperating activities relate to its borrowed money (interest expense of \$337 million) and to its investments (interest and other income of \$232 million). The income statement also reports gains on investments of \$315 million, which are considered nonoperating. Together, Intel’s 2015 pretax nonoperating expense is a “revenue” of \$210 (\$337 million interest expense – \$232 million interest income – \$315 million gain). Because Intel’s net nonoperating activity is revenue, we consider this as a *negative* net nonoperating expense in our NOPAT calculations.

For 12 Months Ended (\$ millions)	Dec. 26, 2015	Dec. 27, 2014	Dec. 28, 2013
Net revenue	\$55,355	\$55,870	\$52,708
Cost of sales.....	20,676	20,261	21,187
Gross margin	34,679	35,609	31,521
Research and development.....	12,128	11,537	10,611
Marketing, general and administrative.....	7,930	8,136	8,088
Restructuring and asset impairment charges	354	295	240
Amortization of acquisition-related intangibles.....	265	294	291
Operating expenses.....	20,677	20,262	19,230
Operating income.....	14,002	15,347	12,291
Interest and other expense (income), net	105	(43)	151
(Gains) on equity investments, net	(315)	(411)	(471)
Income before taxes.....	14,212	15,801	12,611
Provision for taxes	2,792	4,097	2,991
Net income.....	\$ 11,420	\$ 11,704	\$ 12,620

Net Operating Profit After Tax (NOPAT)

To compute NOPAT, we start with net operating profit before tax from the income statement and use the following formula:

$$\text{Net operating profit after tax} = \text{Net operating profit before tax} - \text{Tax on operating profit}$$

Intel's income statement reports net operating profit before tax of \$14,002 million and we need to subtract taxes on operating profit to determine net operating profit after tax.

Tax on Operating Profit The tax expense that companies report on their income statements pertains to both operating *and* nonoperating activities. To compute NOPAT, we need to compute the tax expense relating solely to operating profit as follows:

$$\text{Tax on operating profit} = \text{Tax expense} + (\text{Pretax net nonoperating expense} \times \text{Statutory tax rate})$$

↓
Tax Shield

The amount in parentheses is called the tax shield, which are the taxes that a company saves by having tax-deductible nonoperating expenses (see Tax Shield box below for details). By definition, the taxes saved (by the tax shield) do not relate to operating profits; thus, we must add back the tax shield to total tax expense to compute the tax on operating profit. For companies with nonoperating revenue and gains greater than nonoperating expenses, so called nonoperating revenue, the "pretax net nonoperating expense" is a negative number which yields a negative tax shield. A negative tax shield implies that the company is paying more tax than it would have paid if not for the additional nonoperating income. Tax on operating profit is computed in the same manner as in the equation above, we add the negative tax shield to tax expense.

The statutory federal tax rate for corporations is 35% (per U.S. tax code). Also, most states and some local jurisdictions tax corporate income, and state taxes are deductible for federal tax purposes. The net state tax rate is the statutory rate less the federal tax deduction. The tax rate on operating profit is the sum of the two. On average, the net state tax is about 2%; thus, we use 37% (35% + 2%) as the assumed tax rate on nonoperating expenses and revenues in our examples and assignments at the end of the module.

Business Insight ■ Tax Rates for Computing NOPAT

In our examples and assignments, we assume the statutory tax rate is 37% as this is the approximate average combined federal and state tax rate for public companies. We can, as an alternative, compute a *company-specific* tax rate using the income tax footnote in the 10-K. For example, Intel provides the following table in its 10-K for the year ended December 26, 2015.

Fiscal Years Ended	Dec. 26, 2015	Dec. 27, 2014	Dec. 28, 2013
Federal statutory rate effect of:.....	35.0%	35.0%	35.0%
Non-U.S. income taxed at different rates.....	(7.9)	(6.1)	(5.8)
Domestic manufacturing deduction benefit.....	(2.0)	(2.1)	(2.1)
Research and development tax credits	(1.7)	(1.7)	(3.5)
Other reconciling items.....	<u>(3.8)</u>	<u>0.8</u>	<u>0.1</u>
Effective rate.....	<u>19.6%</u>	<u>25.9%</u>	<u>23.7%</u>

The federal statutory rate is 35.0%, and Intel does pay state taxes but the amount is immaterial and so the company does not separately report the rate (it also reports reductions of 7.9% relating to effects of taxes on income outside the U.S. and several other deductions and credits that total 7.5%). Thus, Intel's effective tax rate (or average) for all of its income is the sum of all its taxes paid less benefits received, or 19.6%. However, the tax shield that we add back in computing NOPAT uses only federal and state tax rates. For Intel, the company-specific tax rate that we could use to compute the tax shield is 35%. It would be incorrect, however, to use Intel's 19.6% company-specific effective tax rate to compute NOPAT, as that rate includes both operating and nonoperating items. We discuss income tax more fully in later modules.

Applying this method to Intel for fiscal 2015, yields a tax shield of \$(78) million, that is, a negative tax shield. This is computed as pretax net nonoperating expense of \$(210) million times its statutory tax rate of 37% and tax on operating profit is therefore, \$2,714 million (computed as \$2,792 million + \$(78) million). We subtract the tax on operating profit from the net operating profit before tax to obtain NOPAT. Thus, Intel's net operating profit after tax is computed as follows (\$ millions).

Net operating profit before tax (NOPBT).....	\$14,002
Less tax on operating profit	
Tax expense (from income statement).....	\$2,792
Plus tax shield \$(210) × 37%.....	<u>+(78)</u>
Net operating profit after tax (NOPAT).....	<u>(2,714)</u>
	\$11,288
	<u> </u>

Business Insight ■ Tax Shield

Persons with home mortgages understand well the beneficial effects of the "interest tax shield." To see how the interest tax shield works, consider two individuals, each with income of \$50,000 and each with only one expense: a home. Assume that one person pays \$10,000 per year in rent; the other pays \$10,000 in interest on a home mortgage. Rent is not deductible for tax purposes, whereas mortgage interest (but not principal) is deductible. Assume that each person pays taxes at 25%, the personal tax rate for this income level. Their tax payments are as follows.

	Renter	Homeowner
Income before interest and taxes.....	\$50,000	\$50,000
Less interest deduction.....	<u>0</u>	<u>(10,000)</u>
Taxable income	<u>\$50,000</u>	<u>\$40,000</u>
Taxes paid (25% rate)	\$12,500	\$10,000

The renter reports \$50,000 in taxable income and pays \$12,500 in taxes. The homeowner deducts \$10,000 in interest, which lowers taxable income to \$40,000 and reduces taxes to \$10,000. By deducting mortgage interest, the homeowner's tax bill is \$2,500 lower. The \$2,500 is the *interest tax shield*, and we can compute it directly as the \$10,000 interest deduction multiplied by the 25% tax rate.

Refer to the following income statement for **Cisco Systems Inc.** to answer the requirements.



CISCO SYSTEMS INC.	July 25, 2015
Fiscal year ended (\$ millions)	
Total revenue	\$49,161
Total cost of sales	<u>19,480</u>
Gross margin	29,681
Research and development.....	6,207
Sales and marketing	9,821
General and administrative	2,040
Amortization of purchased intangible assets.....	359
Restructuring and other charges.....	<u>484</u>
Total operating expenses	<u>18,911</u>
Operating income.....	10,770
Interest income	(769)
Interest expense	566
Other income.....	<u>(228)</u>
Interest and other income, net	<u>(431)</u>
Income before provision for income taxes	11,201
Provision for income taxes.....	<u>2,220</u>
Net income.....	<u><u>\$8,981</u></u>

Required

- Determine net operating profit before tax (NOPBT) for fiscal 2015.
- Compute tax on operating profit for fiscal 2015.
- Compute NOPAT using the formula: NOPBT – Tax on operating profit.

Solution on p. 4-65.

Return on Net Operating Assets (RNOA)

To determine average NOA, we take a simple average of two consecutive years' numbers. Return on net operating assets (RNOA) for Intel for 2015 is computed as follows (\$ millions).



$$\text{RNOA} = \frac{\text{Net operating profit after tax}}{\text{Average net operating assets}} = \frac{\$11,288}{(\$51,488 + \$47,258)/2} = 22.86\%$$

Intel's 2015 RNOA is 22.86%. By comparison, the RNOA for **Cisco Systems** a competitor to Intel, is 34.78% (this computation is shown in Review 4-6). The average RNOA for publicly traded companies is about 9.2% after the economy emerged from recession in 2010, which is apparent from the Research Insight titled "Ratio Behavior over Time" located before Review 4-6.

RNOA vs ROA A comparison of Intel's RNOA of 22.86% with the ROA of 11.71%, computed earlier, yields insight into the benefits of an operating focus.

\$ millions	ROA (DuPont analysis)	RNOA (Operating focus)	Computation
Net income.....	\$11,420		
Net operating profit after tax (NOPAT)....		\$11,288	
Average assets.....	\$97,483		(\$103,065 + \$91,900)/2
Average net operating assets (NOA)		\$49,373	(\$51,488 + \$47,258)/2
ROA.....	11.71%		\$11,420 / \$97,483
RNOA.....		22.86%	\$11,288 / \$49,373

ROA Components The operating focus to ROE excludes \$132 million of net income (relating to investment returns net of interest expense, after tax) and excludes \$9,102 million of net nonoperating assets (average investment securities of \$28,169 million less average nonoperating liabilities of \$19,067 million, computed as $[\$2,634 + \$20,933 + \$1,596 + \$12,971]/2$). The net return on these net nonoperating assets is 1.45% ($\frac{\$132 \text{ million}}{\$9,102 \text{ million}}$). The return on assets computed under the traditional DuPont approach is actually a weighted average of the return on operating assets and the return on net nonoperating assets (\$ millions).

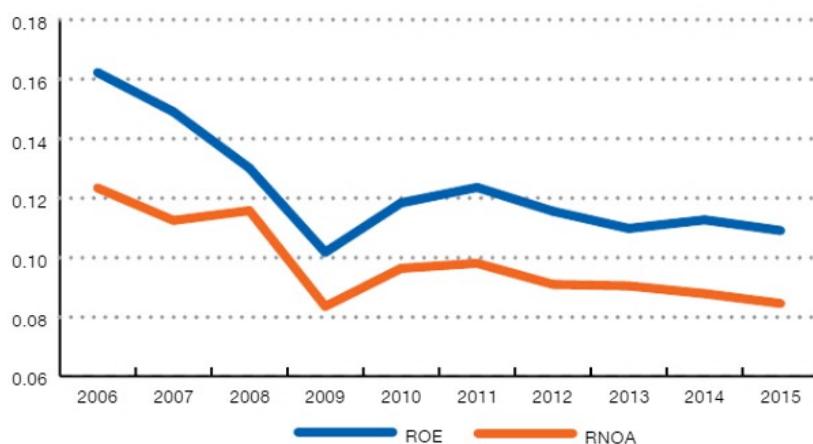
$$\left(22.86\% \times \frac{\$49,373}{\$97,483} \right) + \left(0.145\% \times \frac{\$9,102}{\$97,483} \right) = 11.71\%$$

It is clear that both sides of Intel's business create positive returns for shareholders—operations are returning 22.86% and nonoperating activities are returning 1.45%. But the low return on nonoperating activities creates a drag on overall return to the shareholders. This insight is lost with the traditional DuPont analysis. Exhibit 4.8 summarized the key metrics applied in this section. We now extend the operating focus to the second level of analysis for each component of RNOA.

Exhibit 4.8 ■ Key Ratio and Acronym Definitions

Ratio	Definition
ROE: Return on equity	Net income attributable to controlling interest/Average equity attributable to controlling interest
NOA: Net operating assets	Operating assets less operating liabilities; it excludes nonoperating items such as investments in marketable securities and interest-bearing debt.
NOPAT: Net operating profit after tax	Operating revenues less operating expenses such as cost of sales, selling, general and administrative expense, and taxes; it excludes nonoperating revenues and expenses such as interest revenue, dividend revenue, interest expense, gains and losses on investments, discontinued operations.
RNOA: Return on net operating assets	NOPAT / Average NOA

How do RNOA and ROE behave over time? Following is a graph of average RNOA and ROE for a large set of firms over the past decade. We see there is considerable variability in these ratios over time. The proportion of RNOA to ROE is greater for some periods of time than for others. Yet, in all periods for this large sample of firms, ROE exceeds RNOA. This is evidence of the positive effect of leverage on ROE.



LO6 Review 4-6

Refer to Review 4-4 (for NOA) and 4-5 (for NOPAT) for [Cisco Systems](#) to complete the following requirement.

**Required**

Compute and interpret return on net operating assets (RNOA) for fiscal year 2015.

Solution on p. 4-65.

RNOA Disaggregation into Margin and Turnover

Similar to the components of ROA, we can disaggregate RNOA into net operating profit margin and net operating asset turnover to gain further insights into a company's performance. This disaggregation follows.

$$\text{RNOA} = \frac{\text{NOPAT}}{\text{Average NOA}} = \frac{\text{NOPAT}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average NOA}}$$



LO7
MBC Disaggregate RNOA into net operating profitability and net operating asset turnover.

Net Operating Profit Margin

Net operating profit margin (NOPM) reveals how much operating profit the company earns from each sales dollar. All things equal, a higher net operating profit margin is preferable. Net operating profit margin is affected by the level of gross profit the company earns on its products (revenue minus cost of goods sold), which depends on product prices and manufacturing or purchase costs. Net operating profit margin is also affected by the level of operating expenses the company requires to support its products or services. This includes overhead costs such as wages, marketing, occupancy, and research and development. Finally, net operating profit margin is affected by the level of competition (which affects product pricing) and the company's willingness and ability to control costs.

Intel's net operating profit margin is computed as follows (\$ millions).

$$\text{Net operating profit margin} = \frac{\text{Net operating profit after tax}}{\text{Sales}} = \frac{\$11,288}{\$55,355} = 20.39\%$$

This result means that for each dollar of sales at Intel, the company earns roughly 20.39¢ profit after all operating expenses and taxes. As a reference, the median NOPM for U.S. publicly traded companies with revenues greater than \$1 billion in 2015 is about 8¢.

Analysis of net operating profit margin examines the ratio over time and in comparison with peers. As with net profit margin in the DuPont analysis, the net operating profit margin includes effects from the gross profit margin (Gross profit/Sales) and the operating expense margin (Operating expenses/Sales). A second level analysis of net operating profit margin examines these components to uncover underlying trends that drive this ratio.

Net Operating Asset Turnover

Net operating asset turnover (NOAT) measures the productivity of the company's net operating assets. This metric reveals the level of sales the company realizes from each dollar invested in net operating assets. All things equal, a higher NOAT is preferable. Intel's net operating asset turnover ratio follows (\$ millions).

$$\text{Net operating asset turnover} = \frac{\text{Sales}}{\text{Average net operating assets}} = \frac{\$55,355}{(\$51,488 + \$47,258) / 2} = 1.12$$

This result means that for each dollar of net operating assets, Intel realizes \$1.12 in sales. As a reference, the median for U.S. publicly traded companies with revenues greater than \$1 billion in 2015 is about \$1.30.

Net operating asset turnover can be increased by either increasing sales for a given level of investment in operating assets, or by reducing the amount of operating assets necessary to generate a dollar of sales, or both. Reducing operating working capital (current operating assets less current operating liabilities) is usually easier than reducing long-term net operating assets. For example, companies can implement strategies to collect their receivables faster, reduce their inventories, and delay payments to their suppliers. All of these actions reduce operating working capital and, thereby, increase NOAT. These strategies must be managed, however, so as not to negatively impact sales or supplier relations. Working capital management is an important part of managing the company effectively.

It is usually more difficult to reduce the level of long-term net operating assets. The level of PPE required by the company is determined more by the nature of the company's business model than by management action. For example, telecommunications companies require more capital investment than do retail stores. Still, there are several actions that managers can take to reduce capital investment. Some companies pursue novel approaches, such as corporate alliances, outsourcing, and use of special purpose entities; we discuss some of these approaches in later modules.

Analysis of net operating asset turnover examines the ratio over time and in comparison with peers. As with asset turnover in the DuPont analysis, the net operating asset turnover includes effects

from the turnovers (and corresponding days) of each of the working capital accounts (accounts receivable, inventory, accounts payable) and effects from the long-term operating assets turnover. A second level analysis of net operating profit margin examines these components to uncover underlying trends that drive this ratio.

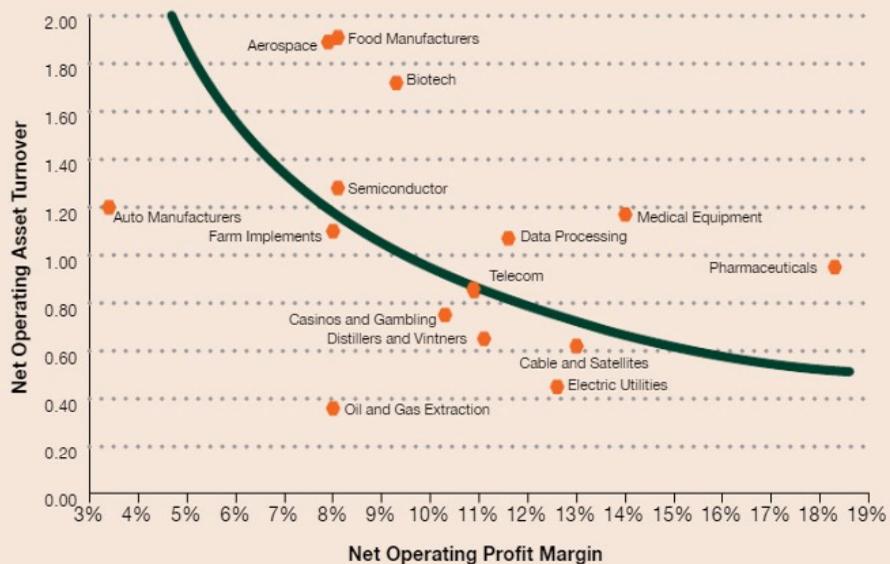
Managerial Decision ■ You Are the CEO

You are analyzing the performance of your company. Your analysis of RNOA reveals the following (industry benchmarks in parentheses): RNOA is 16% (10%), NOPM is 18% (17%), and NOAT is 0.89 (0.59). What interpretations do you draw that are useful for managing your company? [Answer, p. 4-42]

Trade-Off between Margin and Turnover

Net operating profit margin and turnover of net operating assets are largely affected by a company's business model. This is an important concept. Specifically, an infinite number of combinations of net operating profit margin and net operating asset turnover will yield a given RNOA. This relation is depicted in Exhibit 4.9 (where the curved line reflects the median RNOA for all publicly traded companies during 2015).

Exhibit 4.9 ■ Net Operating Asset Profitability and Productivity Across Industries



This exhibit reveals that some industries, such as oil and gas and utilities, are capital intensive with relatively low net operating asset turnover. Accordingly, for such industries to achieve a required RNOA (to be competitive in the overall market), they must obtain a higher profit margin. On the other hand, companies such as food manufacturers and aerospace companies hold fewer assets and, therefore, can operate on lower net operating profit margins to achieve a sufficient RNOA. This is because their asset turnover is far greater.

This exhibit warns of blindly comparing the performance of companies across different industries. For instance, a higher profit margin in the pharmaceutical industry compared with the food manufacturing is not necessarily the result of better management. Instead, the pharmaceutical companies have higher operating assets (typically intangibles related to intellectual property) and thus, to achieve an equivalent RNOA, pharmaceutical companies must earn a higher profit margin to offset their lower asset turnover. Basic economics suggests that all industries must earn an acceptable return on investment if they are to continue to attract investors and survive.

The trade-off between margin and turnover is relatively straightforward when comparing companies that operate in one industry (*pure-play* firms). Analyzing conglomerates that operate in several industries is more challenging. Conglomerates' margins and turnover rates are a weighted average of

the margins and turnover rates for the various industries in which they operate. For example, **Caterpillar Inc.** is a blend of a manufacturing company and a financial institution (**Caterpillar Financial Services Corp.**); thus, the margin and turnover benchmarks for Caterpillar on a consolidated basis are a weighted average of those two industries.

Research Insight ■ NOPM and NOAT Explain Stock Prices

Research shows that stock returns are positively associated with earnings—when companies report higher than expected earnings, stock returns rise. Research also reports that the RNOA components (NOPM and NOAT) are more strongly associated with stock returns and future profitability than earnings (or return on assets) alone. This applies to the short-term market response to earnings announcements and long-term stock price changes. Thus, disaggregating earnings and the balance sheet into operating and nonoperating components is a useful analysis tool.

Source: Soliman, Mark T., "Use of DuPont Analysis by Market Participants," *The Accounting Review*, May 2008, 83(3): 823-853.

Business Insight ■ Other Return Metrics

Many companies report return metrics in their SEC filings (via their proxy statement or their MD&A in the 10-K). Because GAAP does not define return metrics, we see a wide variety in practice. Below are three examples of return metrics taken from 2015 SEC filings.

Company	Ratio	Explanation by company in SEC filing
Walmart	Return on investment (ROI)	"Management believes that return on investment (ROI) is a meaningful metric to share with investors because it helps investors assess how effectively Walmart is deploying its assets."
Halliburton	Return on capital employed (ROCE)	"We believe ROCE is the best indicator of long-term Company performance, while reinforcing the Company's objective for sustained long-term performance and value creation. ROCE measures Company profitability as well as the efficiency by which we deploy capital."
AT&T	Return on invested capital (ROIC)	"Because AT&T is a capital-intensive company, the Committee believes that it is necessary to hold our executive officers accountable for using capital prudently."

The definition of each ratio varies slightly, but the underlying metric is similar to RNOA. For example, AT&T measures return on invested capital (ROIC) as follows: "annual net income plus after-tax interest expense, divided by the total of the average debt and average stockholder equity for the year." At first glance, it might not be apparent but this definition of ROIC is nearly identical to the RNOA we use. Note that NOPAT can be computed as Net income + After-tax non-operating expenses; if interest is the only nonoperating expense, then the ROIC and RNOA numerators are identical. As for the denominator, AT&T sums average debt and average stockholder equity. Consider the accounting equation: Assets = Liabilities + Stockholders' equity, which can be rewritten as:

$$\frac{\text{Operating assets}}{\text{Nonoperating assets}} + \frac{\text{Nonoperating assets}}{\text{Nonoperating assets}} = \frac{\text{Operating liabilities}}{\text{Nonoperating liabilities}} + \frac{\text{Nonoperating liabilities}}{\text{Nonoperating assets}} + \frac{\text{Stockholders' equity}}{\text{Stockholders' equity}}$$

By rearranging terms we see:

$$\frac{\text{Operating assets}}{\text{Operating liabilities}} - \frac{\text{Operating liabilities}}{\text{Operating assets}} = \frac{\text{Nonoperating assets}}{\text{Nonoperating liabilities}} - \frac{\text{Nonoperating liabilities}}{\text{Nonoperating assets}} + \frac{\text{Stockholders' equity}}{\text{Stockholders' equity}}$$

On the left is net operating assets (the denominator in RNOA). The right has debt and stockholders' equity (the denominator in ROIC) less any nonoperating assets. Thus, RNOA and ROIC are nearly identical. Because companies generally report metrics that they adapt for their industry, it is important that we understand the exact definition of the metric before comparing metrics across different companies and industries.



Use the income statement provided in Review 4-5 for **Cisco Systems** and the RNOA computed in Review 4-6 to complete the following requirement.

Required

Disaggregate RNOA into components of net operating profit margin and net operating asset turnover for 2015. **Solution on p. 4-65.**

Global Accounting



An important aim of this module is to distinguish between operating and nonoperating items for the balance sheet and income statement. U.S. GAAP and IFRS generally account for items similarly, but there are certain disclosure differences worth noting.

The IFRS balance sheet is similar to its U.S. GAAP counterpart, with the visible exception for the frequent, but not mandatory, reverse ordering of assets and liabilities. However, one notable difference is that IFRS companies routinely report “financial assets” or “financial liabilities” on the balance sheet. We must assess these items. IFRS defines financial assets to include receivables (operating item), loans to affiliates or associates (can be operating or nonoperating depending on the nature of the transactions), securities held as investments (nonoperating), and derivatives (nonoperating). IFRS notes to financial statements, which tend to be more detailed than U.S. GAAP notes, usually detail what financial assets and liabilities consist of. This helps us accurately determine NOA and net non-operating obligations (NNO).

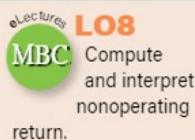
The IFRS income statement usually reports fewer line items than U.S. GAAP income statements and, further, there is no definition of “operating activities” under IFRS. This means we must devote attention to classify operating versus nonoperating income components. Following is a table that shows common U.S. GAAP income statement items and their classification as operating (O) or nonoperating (N). This table also indicates which items are required for IFRS income statements.

Income Statement Line Items	Operating (O) or Nonoperating (N)	Required on IFRS Income Statement
Net sales	O	YES
Cost of sales.....	O	—
Selling, general and administrative (SG&A) expense	O	—
Provisions for doubtful accounts	O	—
Nonoperating income	N	—
Interest revenue and interest expense.....	N	YES
Nonoperating expenses	N	—
Income before income taxes.....	O and N	—
Income tax expense	O and N	YES
Earnings on equity investments (associates and joint ventures)....	O	YES
Income from continuing operations	O	—
Discontinued operations.....	N	YES
Net income.....	O and N	YES
Net income attributable to noncontrolling interest.....	N	YES
Net income attributable to controlling interest	O and N	YES
Earnings per share (Basic EPS and Diluted EPS).....	O and N	YES

There is no requirement to report income from operations, yet many IFRS companies do so. However, items that are considered operating such as gains and losses on disposals of operating assets, or income from equity method investments, are often reported below the operating income line. We must examine IFRS income statements and their notes to make an independent assessment of what

is operating. IFRS income statements usually report separately the other nonoperating revenues and expenses even though this is not required. We can better assess the nature of these items by reading the accompanying notes.

Appendix 4A: Nonoperating Return Component of ROE



Nonoperating Return

Recall that ROE can be written as:

$$\text{ROE} = \text{Operating return} + \text{Nonoperating return}$$

In simple form, return on nonoperating activities measures the extent to which a company is using debt to increase its return on equity.

We can infer the nonoperating return indirectly as the difference between ROE and RNOA. We can also compute the nonoperating return directly as follows:

$$\text{Nonoperating return} = \text{Financial Leverage} \times \text{Spread}$$

where Spread is the difference between return on net operating assets and the after-tax cost of debt, net of any after-tax returns on nonoperating assets such as investments in marketable securities.

This means return on equity can be disaggregated as:

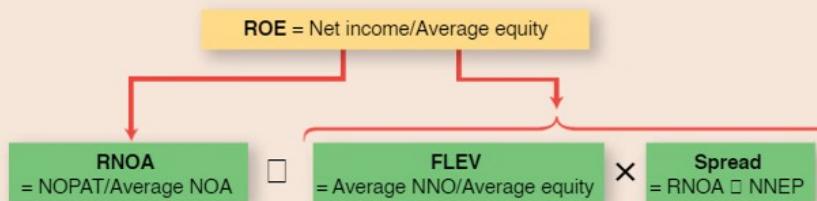


Exhibit 4A.1 provides definitions for each of the terms required in this computation.

Exhibit 4A.1 ■ Nonoperating Return Definitions

NNO: Net nonoperating obligations	Nonoperating liabilities less nonoperating assets
FLEV: Financial leverage	Average NNO/Average total stockholders' equity
NNE: Net nonoperating expense	NOPAT - Consolidated net income; or Nonoperating expenses $\times (1 - \text{Statutory tax rate})$
NNEP: Net nonoperating expense percent.....	NNE/Average NNO
Spread:	RNOA - NNEP

In most cases, nonoperating return is positive and it increases ROE. However, there are a number of other situations where the company's nonoperating activities are more complex. And in some situations, the nonoperating return is negative (as for Intel). In this section, we illustrate four specific situations and demonstrate how to directly compute nonoperating return in each case.

Nonoperating Return—with Debt Financing

The following illustration provides the intuition for the simple case when a company has debt (nonoperating obligations) but no nonoperating assets (such as cash).

Assume that a company has \$1,000 in average net operating assets during the year and earns net operating profit after tax (NOPAT) of \$200; yielding a 20% RNOA ($\text{NOPAT}/\text{Average NOA} = \$200/\$1,000$). (To simplify the example, assume a tax rate of 0%.) The company finances the assets entirely with equity and thus ROE is also 20% ($\text{Net income}/\text{Average equity} = \$200/\$1,000$).

Next assume that the company borrows \$500 at 7% and uses the funds to acquire additional operating assets that yield the same RNOA of 20%. Its net operating assets are now \$1,500 and its profit is \$265, computed as:

Profit from assets financed with equity ($\$1,000 \times 20\%$).....		\$200
Profit from assets financed with debt ($\$500 \times 20\%$).....	\$100	
Less interest expense from debt ($\$500 \times 7\%$).....	(35)	65
Net income.....		<u><u>\$265</u></u>

We see that this company increased its net income by \$65 with the addition of debt and ROE is now 26.5% ($\$265/\$1,000$). The reason ROE increased is that the company borrowed at 7% and invested in assets that earned 20%.

$$\begin{aligned} \text{ROE} &= \text{Operating return} + \text{Nonoperating return} \\ \text{ROE} &= 20\% + 6.5\% \\ \text{ROE} &= 26.5\% \end{aligned}$$

The company has made good use of debt to increase its ROE for equity holders by 6.5%. We can compute the 6.5% nonoperating return directly as FLEV \times Spread, as follows:

$$\text{FLEV} = \frac{\text{Average net nonoperating obligations (NNO)}}{\text{Average stockholders' equity (EQ)}} = \frac{\$500}{\$1,000} = 0.50$$

$$\text{NNEP} = \frac{\text{Net nonoperating expense}}{\text{Average net nonoperating obligations (NNO)}} = \frac{\$35}{\$500} = 7\%$$

$$\text{Spread} = \text{RNOA} - \text{NNEP} = 20\% - 7\% = 13\%$$

$$\text{Nonoperating return} = \text{FLEV} \times \text{Spread} = 0.50 \times 13\% = 6.5\%$$

In this simple example, the company's nonoperating activities relate solely to debt and in that special case, FLEV is identical to the traditional debt-to-equity ratio.

Nonoperating Return—With Debt Financing and Nonoperating Assets

Most companies report both debt and investments on their balance sheets. If that debt markedly exceeds the investment balance, their ROE will look like our first example (with debt only). Instead, if investments predominate, their ROE will look more like Intel's. We compute nonoperating return for McDonald's, a company with both debt and investments.

The table below shows data from McDonald's 2015 financial statements. With these numbers, we can compute NNE as $(\$638.3 \text{ million} - \$48.5 \text{ million}) \times (1 - 37\%) = \371.6 million . McDonald's interest expense on its debt exceeds its nonoperating income and thus, NNE is a positive number. In general NNE can include interest income, dividend income, gains and losses on investments, as well as any income or losses on discontinued operations, all net of tax.

For McDonald's, we compute NOPAT as \$4,900.9 million, calculated as net operating profit before tax of \$7,145.5 million less taxes on operating profit of \$2,244.6 million, computed as $[\$2,026.4 \text{ million} + (\$589.8 \text{ million} \times 37\%)]$.

Balance Sheet Data (\$ millions)	2015	2014
Operating assets.....	\$30,253.2	\$32,149.5
Operating liabilities	<u>6,495.6</u>	<u>6,204.6</u>
Net operating assets (NOA)	23,757.6	25,944.9
Nonoperating liabilities.....	24,355.2	15,169.4
Nonoperating assets	<u>7,685.5</u>	<u>2,077.9</u>
Net nonoperating obligations (NNO).....	16,669.7	13,091.5
Equity (EQ).....	\$17,087.9	\$12,853.4

continued

Income Statement Data (\$ millions)

Net operating profit before tax.....	\$ 7145.5
Interest expense	\$ 638.3
Nonoperating (income) expense	(48.5) 589.8
Provision for income taxes.....	2,026.4
Net income.....	\$ 4,529.3

We compute McDonald's RNOA as NOPAT/Average NOA = \$4,900.9 million/(\$23,757.6 million + \$25,944.9 million/2) = 19.72%. To compute NNEP we use the following definition:

$$\text{Net nonoperating expense percent (NNEP)} = \frac{\text{Net nonoperating expense (NNE)}}{\text{Average net nonoperating obligations (NNO)}}$$

The net nonoperating expense percent (NNEP) measures the average cost of net nonoperating obligations. The denominator uses the average NNO similar to the return calculations (such as ROE and RNOA).

In the case of debt only, from above, net nonoperating expense percent is 7%, computed as \$35/\$500, which is exactly equal to the interest rate on the loan. With real financial statements, NNEP is more complicated because NNE often includes both interest on borrowed money and nonoperating income, and NNO is the net of nonoperating liabilities less nonoperating assets. Thus NNEP reflects an average return on nonoperating activities. For McDonald's, its 2015 NNEP is 2.50% computed as \$371.6 million/[\$16,669.7 million + \$13,091.5 million/2]. McDonald's RNOA is 19.72%, which means that net operating assets generate more return than the 2.5% cost of net nonoperating obligations. That is, McDonald's earns a Spread of 17.22%, the difference between RNOA (19.72%) and NNEP (2.5%), on each asset financed with borrowed funds. By borrowing funds, McDonald's creates leverage, which can be measured relative to stockholders' equity; that ratio is called financial leverage (FLEV). In sum, total nonoperating return is computed by the following formula:

$$\text{Nonoperating return} = \frac{\text{Average net nonoperating obligations (NNO)}}{\text{Average stockholders' equity (EQ)}} \times (\text{RNOA} - \text{NNEP})$$



Two points are immediately clear from this equation. First, ROE increases with the Spread between RNOA and NNEP. The more profitable the return on operating assets, the higher the return to stockholders. Second, the higher the debt relative to equity, the higher the ROE (assuming, of course, a positive Spread).

McDonald's has average NNO of \$14,880.6 million [(\$16,669.7 million + \$13,091.5 million)/2] and average equity of \$9,970.7 million [(\$7,087.9 million + \$12,853.4 million)/2]. Thus, McDonald's ROE is as follows:

$$\begin{aligned} \text{ROE} &= \text{Operating return} + \text{Nonoperating return} \\ &= 19.72\% + [\$14,880.6/\$9,970.7] \times [19.72\% - 2.50\%] \\ &= 19.72\% + [1.4924] \times [17.22\%] \\ &= 45.42\% \end{aligned}$$

Most companies report both debt and investments on their balance sheets. If that debt markedly exceeds the investment balance, their ROE will look more like our McDonald's example (with net debt). Instead, if investments predominate, their ROE will look more like Intel's (with net investments). It is important to remember that both the average NNO (and FLEV) and NNE can be either positive (debt) or negative (investments), and it is not always the case that ROE exceeds RNOA.

Nonoperating Return—Without Debt Financing, but with Nonoperating Assets

Many tech firms, including **Intel**, have low levels of debt and maintain large portfolios of marketable securities. They hold these highly liquid assets so that they can respond quickly to new opportunities or react to competitive pressures. With high levels of nonoperating assets and no nonoperating liabilities, the net nonoperating

obligations (NNO) has a negative sign (NNO = Nonoperating liabilities – Nonoperating assets). Likewise, FLEV is negative: Average NNO (–)/Average equity (+). Further, net nonoperating expense is negative because investment *income* is a negative nonoperating expense. However, the net nonoperating expense percent (NNEP) is positive because the negative NNE is divided by the negative NNO. We can indirectly determine Intel's nonoperating return as –3.33% by subtracting RNOA from ROE (19.53% – 22.86%). We can also calculate nonoperating return directly.

Intel (\$ millions)	2015	2014	Average	Computation
NOA	\$51,488	\$47,258	\$49,373	See page 4-19
NNO	\$ (9,597)	\$ (8,607)	\$ (9,102)	
Equity	\$61,085	\$55,865	\$58,475	From balance sheet on page 4-18
Net income.....	\$11,420	—	—	From income statement on page 4-22
NOPAT.....	\$11,288	—	—	\$14,002 – {\$2,792 + [\$(210) × 37%]}
NNE	\$(132)	—	—	\$(210) × (1 – 0.37)
FLEV.....	(0.1557)	—	—	\$(9,102) / \$58,475
RNOA.....	22.86%	—	—	\$11,288 / \$49,373
NNEP	1.45%	—	—	\$(132) / \$(9,102)
Spread	21.41%	—	—	22.86% – 1.45%
ROE.....	19.53%	—	—	\$11,420 / \$58,475

Intel's NNO is negative because its investment in marketable securities exceeds its debt. Intel's ROE consists of the following components.

$$\begin{aligned}
 \text{ROE} &= \text{RNOA} + [\text{FLEV} \times \text{Spread}] \\
 &= 22.86\% + [-0.1557 \times 21.41\%] \\
 &= 22.86\% + [-3.33\%] \\
 &= 19.53\%
 \end{aligned}$$

Intel's ROE is lower than its RNOA because of its large investment in marketable securities. That is, its excessive liquidity is penalizing its return on equity. The rationale for this seemingly incongruous result is this: Intel's ROE derives from operating and nonoperating assets. Intel's operating assets are providing an outstanding return (22.86%), much higher than the cost of its debt net of the return on its marketable securities (1.45%). Holding liquid assets that are less productive means that Intel's stockholders are funding a sizeable level of liquidity, and sacrificing returns in the process. Why? Many companies in high-tech industries feel the need to maintain excessive liquidity to gain flexibility—the flexibility to take advantage of opportunities and to react quickly to competitor maneuvers. Intel's management, evidently, feels that the investment of costly equity capital in this manner will reap future rewards for its stockholders. Its 19.53% ROE provides some evidence that this strategy is not necessarily misguided.

Nonoperating Return—with Debt Financing, Nonoperating Assets, and Noncontrolling Interest

When a company acquires controlling interest of the outstanding voting stock of another company, the parent company must consolidate the new subsidiary in its balance sheet and income statement. This means that the parent company must include 100% of the subsidiary's assets, liabilities, revenues, and expenses. If the parent acquires less than 100% of the subsidiary's voting stock, the remaining claim of noncontrolling stockholders is reported on the balance sheet as a component of stockholders' equity called noncontrolling interest, and net income is separated into income attributable to company stockholders and that attributable to noncontrolling interests. *The ROE computation, then, should use the net income attributable to company stockholders divided by the average stockholders' equity attributable to controlling interest, which excludes noncontrolling interest.* For firms with noncontrolling interests, we compute RNOA as usual because NOPAT is operating income before any noncontrolling interest on the income statement, and NOA is unaffected by noncontrolling interest on the balance sheet. Similarly, we compute Spread and FLEV as usual. However, we must modify the $\text{ROE} = \text{RNOA} + [\text{FLEV} \times \text{Spread}]$ formula slightly. Recall that a company's operating and nonoperating activities generate returns to both the controlling interest (labeled CI, which is the parent company's stockholders' equity) and the noncontrolling stockholders (labeled NCI). To account for this, we must multiply the ROE equation, $\text{RNOA} + [\text{FLEV} \times \text{Spread}]$, by a ratio that captures the relative income statement and balance sheet effects of the noncontrolling interest. This ratio is called the *noncontrolling interest ratio*, and is computed as follows:

$$\text{Noncontrolling interest ratio} = \left[\frac{\left(\frac{\text{Net income attributable to controlling interest (NI}_{CI})}{\text{Net income (NI)}} \right)}{\left(\frac{\text{Average equity attributable to controlling interest (CI)}}{\text{Average total equity (EQ)}} \right)} \right]$$

Hence, for companies with a noncontrolling interest (NCI), the disaggregated return on equity is expressed as:

$$\text{ROE} = [\text{RNOA} + (\text{FLEV} \times \text{Spread})] \times \text{NCI ratio}$$

To illustrate the calculation of ROE, FLEV, and Spread in the presence of noncontrolling interest, we consider the balance sheet and income statement items from **Walmart** (\$ millions).

Walmart	2015	2014	Average
Balance sheet items			
Net operating assets (NOA)			
	\$124,940	\$126,967	\$125,954
Net nonoperating obligations (NNO)	\$41,329	\$41,030	\$41,180
Noncontrolling interest (NCI)	3,065	4,543	3,804
Walmart parent stockholders' equity (CI)	80,546	81,394	80,970
Total equity (NCI + CI)	83,611	85,937	84,774
Total net nonoperating obligations and Total equity	\$124,940	\$126,967	\$125,954
Income statement items			
Net operating profit after tax (NOPAT).....			
	\$16,634		
Net nonoperating expense (NNE).....	1,554		
Net income.....	15,080		
Net income attributable to noncontrolling interest (NI _{NCI}).....	(386)		
Net income attributable to Walmart stockholders (NI _{CI}).....	\$14,694		

We compute Walmart's ROE for 2015 using the formula above (computations are in right column).

RNOA = NOPAT/Average NOA.....	13.21%	\$16,634/\$125,954
ROE = NI _{CI} /Average CI.....	18.15%	\$14,694/\$80,970
FLEV = Average NNO/Average EQ	0.4858	\$41,180/\$84,774
NNEP = NNE/Average NNO	3.77%	\$1,554/\$41,180
Spread = RNOA - NNEP	9.44%	13.21% - 3.77%
Noncontrolling interest (NCI) ratio	1.0202	$\left(\frac{\$14,694}{\$80,970} \right) / \left(\frac{\$15,080}{\$84,774} \right)$
ROE = [RNOA + (FLEV × Spread)] × NCI ratio	18.16%*	[13.21% + (0.4858 × 9.44%)] × 1.0202

*The 0.01% difference is due to rounding.

Review 4-8 LO8



Refer to **Cisco Systems**' balance sheet from Review 4-4 and its income statement from Review 4-5, along with its ROE and RNOA computations from Reviews 4-1 and 4-6, respectively, to complete the requirements below.

Required

- Use ROE and RNOA ratios to determine the nonoperating return.
- Compute net nonoperating obligations (NNO) and FLEV.
- Compute net nonoperating expense (NNE) and net nonoperating expense as a percentage of NNO (NNEP).
- Determine Spread using the formula: RNOA - NNEP.
- Demonstrate that ROE = [RNOA + (FLEV × Spread)] × NCIR.

continued

Note: Cisco's balance sheet (but not its income statement) reports noncontrolling interest. The noncontrolling interest ratio (NCIR) is calculated as follows.

Net income to controlling interest.....	\$ 8,981
Net income	\$ 8,981
Numerator of NCI ratio	1.00000
Average equity to controlling interest $(\$59,698 + \$56,654)/2$	\$ 58,176
Average total equity $(\$59,707 + \$56,661)/2$	\$ 58,184
Denominator of NCI ratio.....	0.99986
Noncontrolling interest ratio (NCIR).....	1.00014

Solution on p. 4-66.

Appendix 4B: Liquidity and Solvency Analysis

Companies can effectively use debt to increase return on equity via nonoperating return. We might further ask: if a higher ROE is desirable, why don't companies use the maximum debt possible? The short answer is that lenders such as banks and bondholders, charge successively higher interest rates for increasing levels of debt relative to the amount of equity investment. At some point, the cost of the additional debt exceeds the return on the additional assets acquired from the debt financing. Thereafter, further debt financing does not make economic sense. The market, in essence, places a limit on the level of debt that a company can effectively acquire. In sum, stockholders benefit from increased use of debt provided that the assets financed with the debt earn a return that exceeds the cost of the debt.

Creditors usually require a company to execute a loan agreement that places varying restrictions on the company's operating activities. These restrictions, called *covenants*, help safeguard debtholders in the face of increased risk. Covenants exist because debtholders do not have a voice on the board of directors like stockholders do. These debt covenants impose a "cost" on the company beyond that of the interest rate, and these covenants are more stringent as a company increases its reliance on debt financing.

In this Appendix, we explore how much debt a company can reasonably manage. We examine a number of liquidity and solvency metrics that lenders use to assess the default risk and set interest rates. Credit analysts typically use the same ratios to develop credit ratings, which are key determinants of bond prices and cost of debt financing for public companies.

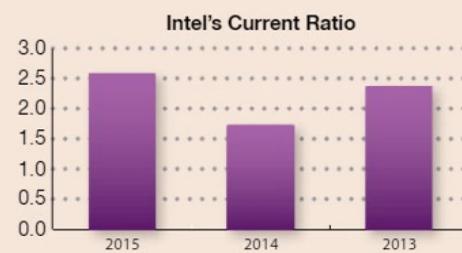
LO9
MBC Compute and interpret measures of liquidity and solvency.

Liquidity Analysis

Liquidity refers to cash availability: how much cash a company has, and how much it can raise on short notice. Two of the most common ratios used to assess the degree of liquidity are the current ratio and the quick ratio. Both of these ratios link required near-term payments to cash available in the near-term.

Current Ratio

Current assets are assets that a company expects to convert into cash within the next operating cycle, which is typically a year. *Current liabilities* are liabilities that come due within the next year. An excess of current assets over current liabilities (Current assets – Current liabilities), is known as *net working capital* or simply *working capital*.² Positive working capital implies that cash generated by "liquidating" current assets would be sufficient to pay current liabilities. The current ratio expresses working capital as a ratio and is computed as follows:



² Both operating assets and operating liabilities can be either current or long-term. "Current" means that the asset is expected to be used, or the liability paid, within the next operating cycle or one year, whichever is longer, which for most companies means a year. Using the current versus long-term nature of operating assets and liabilities we derive two types of net operating assets: net operating working capital (NOWC), and net long-term operating assets. Net operating working capital is defined as:

$$\text{Net operating working capital (NOWC)} = \text{Current operating assets} - \text{Current operating liabilities}$$

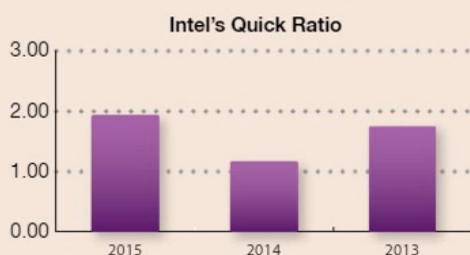
For Intel, NOWC is \$2,010 million for 2015 (\$4,787 million + \$5,167 million + \$2,036 million + \$3,053 million – \$2,063 million – \$3,138 million – \$960 million – \$2,188 million – \$4,684 million).

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

A current ratio greater than 1.0 implies positive working capital. Both working capital and the current ratio consider existing balance sheet data only and ignore cash inflows from future sales or other sources. The current ratio is more commonly used than working capital because ratios allow comparisons across companies of different size. Generally, companies prefer a higher current ratio; however, an excessively high current ratio indicates inefficient asset use. Furthermore, a current ratio less than 1.0 is not always bad for at least two reasons:

1. A cash-and-carry company with comparatively fewer accounts receivable (like Walmart for example) can have potentially few current assets (and a low current ratio), but consistently large operating cash inflows ensure the company will be sufficiently liquid.
2. A company can efficiently manage its working capital by minimizing receivables and inventories and maximizing payables. [Walmart](#), for example, uses its buying power to exact extended credit terms from suppliers. Consequently, because it is essentially a cash-and-carry company, its current ratio is less than 1.0 and is sufficiently liquid.

[Intel](#) does not use such a strategy; its accounts receivable and inventory have grown over time whereas accounts payable and accrued expenses have decreased. The aim of current ratio analysis is to discern if a company is having, or is likely to have, difficulty meeting its short-term obligations. Intel's current ratio for 2015 is 2.576 (\$40,356 million/\$15,667 million). The company's high current ratio derives primarily from its liquid investments.



Quick Ratio

The quick ratio is a variant of the current ratio. It focuses on quick assets, which are assets likely to be converted to cash within a relatively short period of time. Specifically, quick assets include cash, marketable securities, and accounts receivable; they exclude inventories, prepaid assets, and other current assets. The quick ratio is defined as follows:

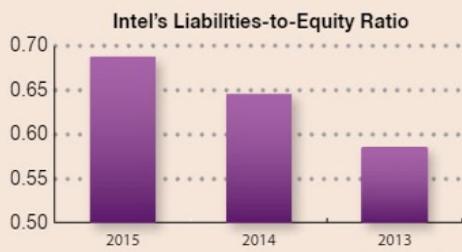
$$\text{Quick ratio} = \frac{\text{Cash} + \text{Marketable securities} + \text{Accounts receivable}}{\text{Current liabilities}}$$

The quick ratio reflects on a company's ability to meet its current liabilities without liquidating inventories. It is a more stringent test of liquidity than the current ratio.

Intel's 2015 quick ratio is 1.92 (\$15,308 million + \$2,682 million + \$7,323 million + \$4,787 million)/\$15,667 million. Like the current ratio, Intel's quick ratio has remained fairly constant over the past three years—see margin graph. It is not uncommon for a company's quick ratio to be less than 1.0. Although liquidity is not a major concern for Intel, the decline in the quick ratio is something financial statement users would want to monitor.

Solvency Analysis

Solvency refers to a company's ability to meet its debt obligations, including both periodic interest payments and the repayment of the principal amount borrowed. Solvency is crucial because an insolvent company is a failed company. There are two general approaches to measuring solvency. The first approach uses balance sheet data and assesses the proportion of capital raised from creditors. The second approach uses income statement data and assesses the profit generated relative to debt payment obligations. We discuss each approach in turn.



Liabilities-to-Equity

The liabilities-to-equity ratio is a useful tool for the first type of solvency analysis. It is defined as follows:

$$\text{Liabilities-to-equity ratio} = \frac{\text{Total liabilities}}{\text{Stockholders' equity}}$$

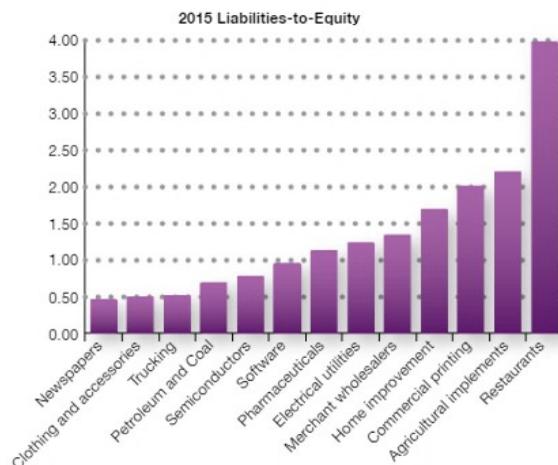
This ratio conveys how reliant a company is on creditor financing compared with equity financing. A higher ratio indicates less solvency, and more risk. Intel's

2015 liabilities-to-equity ratio is 0.69 (\$15,667 million + \$20,933 million + \$2,539 million + \$2,841 million)/\$61,085 million. This ratio has increased somewhat from 0.59 to 0.69 over the past three years—but is still significantly lower than 1.5, the median for publicly traded companies. (Because the numerator of this ratio includes the consolidated liabilities of the company, the denominator must use the company's total equity, which includes any noncontrolling interest reported on the balance sheet.)

A variant of this ratio considers a company's long-term debt divided by equity. This approach assumes that current liabilities are repaid from current assets (so-called self-liquidating). Thus, it assumes that creditors and stockholders need only focus on the relative proportion of long-term capital.

In 2015, the median ratio of total liabilities to stockholders' equity, which measures the relative use of debt versus equity in a company's capital structure, is about 1.4 for U.S. publicly traded companies with sales over \$1 billion. This means that the average company is financed with about \$1.40 of liabilities for each dollar of stockholders' equity. However, the relative use of debt varies considerably across industries as illustrated in Exhibit 4B.1.

Exhibit 4B.1 ■ Median Liabilities-to-Equity Ratio for Selected Industries



Companies in the restaurant, agricultural implement, commercial printing, and home improvement industries have a large proportion of debt. This is typically because companies in these industries have relatively stable cash flows and they can, therefore, support a higher debt level. At the lower end of debt financing are companies, such as newspapers and retail clothing, whose cash flows are less predictable.

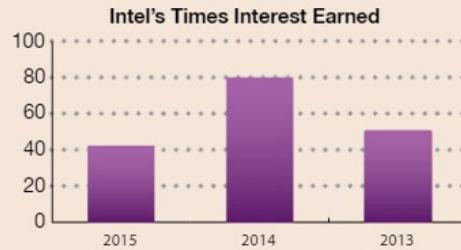
Times Interest Earned

The second type of solvency analysis compares profits to liabilities. This approach assesses how much operating profit is available to cover debt obligations. A common measure for this type of solvency analysis is the times interest earned ratio, defined as follows:

$$\text{Times interest earned} = \frac{\text{Earnings before interest and taxes}}{\text{Interest expense, gross}}$$

The times interest earned ratio reflects the operating income available to pay interest expense. The underlying assumption is that only interest needs to be paid because the principal will be refinanced. This ratio is sometimes abbreviated as EBIT/I. The numerator is similar to net operating profits after tax (NOPAT), but it is *pretax* instead of after tax. We use earnings before net interest expense, that is, net of any other nonoperating income or expenses. We use gross interest, which does not include interest income or other investment income or expenses.

Management wants this ratio to be sufficiently high so that there is little risk of default. Intel's 2015 times interest earned is a healthy 41.55, computed as (\$14,002 million/\$337 million) consistently been very high over the past three years, which implies that Intel could suffer a large decline in profitability and still be able to service



its interest payments when due. Note that the times interest earned ratio uses gross interest expense in the denominator. Intel's income statement reports \$105 million for Interest and other expense (income), net. We can find gross interest expense in footnotes to the financial statements. For Intel in 2015, this amounted to \$337 million.

There are many variations of solvency and liquidity analysis and ratios. The basic idea is to construct measures that reflect a company's credit risk exposure. There is not one "best" financial leverage ratio. Instead, as financial statement users, we want to use measures that capture the risk we are most concerned with. It is also important to compute the ratios ourselves to ensure we know what is included and excluded from each ratio.

Vertical and Horizontal Analysis

Companies come in all sizes, which presents difficulties when making comparisons among firms or over time. There are several methods that attempt to overcome this obstacle.

Vertical analysis expresses financial statements in ratio form. Specifically, it is routine to express income statement items as a percent of net sales, and balance sheet items as a percent of total assets. Such *common-size financial statements* facilitate comparisons *across companies* of different sizes and comparisons of accounts within a set of financial statements.

Horizontal analysis is the scrutiny of financial data *across time*. Comparing data across two or more consecutive periods assists in analyzing trends in company performance and in predicting future performance.

Exhibits 4B.2 and 4B.3 present Intel's common-size balance sheets and common-size income statements. We also present data for horizontal analysis by showing three years of common-size statements.

Intel's total assets (in dollars) have increased by 12.2% since 2013 to over \$100 billion. The sheer size of Intel can make comparisons with other competitors difficult. A common-size analysis such as shown in Exhibits 4B.2 and 4B.3 allows us to compare companies of different sizes by focusing on the relative proportions of balance sheet and income statement accounts.

Intel's most significant assets are its plant assets and goodwill, which account for 31% and 11% of total assets respectively. The company is capital intensive in its manufacturing operations and the goodwill along with the other intangible assets are a testimony to the company's long-standing strategy of growth by acquisition. During 2015 cash grew sharply and while most of the other nonoperating assets decreased, the year over year change in nonoperating assets was an increase of about 40%. Intel is very liquid and as previously mentioned, the company holds liquid assets for future investment purposes. Operating assets as a percentage of total assets have remained at about the same levels for the three-year period and there is nothing startling on the asset side of the balance sheet.

Intel financed its 40.73% of its total assets with liabilities. In dollar terms, liabilities increased sharply in 2015 to \$41,980 million but in common-size terms, this increase was not significant (39% to 41%). The significant increase in liabilities derived almost entirely to the additional debt the company took on in 2015; total debt increased from 15.85% of total assets to 22.87%. At year end, Intel was holding the new borrowed money as cash in anticipation of investment activities in 2016. Operating liabilities declined in both dollar and percentage terms in 2015. A common strategy to improve liquidity is to increase operating liabilities wherever possible (without damaging creditor and supplier relations) so as to improve cash flow. Intel's balance sheet is very liquid and the company does not appear to be engaging in the common strategy.

On the income side, we see that revenue decreased slightly in 2015 after a very significant increase in 2014. We would want to read the MD&A section of the 10-K carefully to understand why sales fell during the year and to determine whether this trend is expected to persist. Despite the decrease in sales, margins are very healthy. Intel's cost of sales decreased fairly significantly in 2014 (by 3.94 percentage points) and then increased slightly in 2015. Over the three-year period, the cost of sales trend is encouraging. For tech companies such as Intel, a major expenditure is research and development. We see that Intel increased its R&D spending during the year both in absolute and percentage terms. R&D costs expensed on the income statement this year may not yield revenue in the current period; revenues may be realized over several future periods. Analysts must carefully read the company's R&D disclosures to assess the long-term potential for dollars spent today. The company held costs down on marketing and general spending. Overall, Intel's relatively high net profit margin is 20.63%, which is significantly higher than what we would see in other more competitive industries. The company produces a high-quality product and is able to command a premium price.

Exhibit 4B.2 ■ Common-Size Balance Sheets

Intel Corporation Common-Size Balance Sheets	Amounts (\$ millions)			Percentages		
	Dec. 26, 2015	Dec. 27, 2014	Dec. 28, 2013	Dec. 26, 2015	Dec. 27, 2014	Dec. 28, 2013
Cash and cash equivalents	\$ 15,308	\$ 2,561	\$ 5,674	14.85%	2.79%	6.14%
Short-term investments	2,682	2,430	5,972	2.60%	2.64%	6.47%
Trading assets	7,323	9,063	8,441	7.11%	9.86%	9.14%
Accounts receivable, net	4,787	4,427	3,582	4.64%	4.82%	3.88%
Inventories	5,167	4,273	4,172	5.01%	4.65%	4.52%
Deferred tax assets.....	2,036	1,958	2,594	1.98%	2.13%	2.81%
Other current assets	3,053	3,018	1,649	2.96%	3.28%	1.79%
Total current assets	40,356	27,730	32,084	39.16%	30.17%	34.74%
Property, plant and equipment, net.....	31,858	33,238	31,428	30.91%	36.17%	34.03%
Marketable equity securities	5,960	7,097	6,221	5.78%	7.72%	6.74%
Other long-term investments	1,891	2,023	1,473	1.83%	2.20%	1.59%
Goodwill.....	11,332	10,861	10,513	11.00%	11.82%	11.38%
Identified intangible assets, net	3,933	4,446	5,150	3.82%	4.84%	5.58%
Other long-term assets.....	7,735	6,505	5,489	7.50%	7.08%	5.94%
Total assets.....	<u>\$103,065</u>	<u>\$91,900</u>	<u>\$92,358</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>
Short-term debt.....	\$ 2,634	\$ 1,596	\$ 281	2.56%	1.74%	0.30%
Accounts payable.....	2,063	2,748	2,969	2.00%	2.99%	3.21%
Accrued compensation and benefits	3,138	3,475	3,123	3.04%	3.78%	3.38%
Accrued advertising.....	960	1,092	1,021	0.93%	1.19%	1.11%
Deferred income.....	2,188	2,205	2,096	2.12%	2.40%	2.27%
Other accrued liabilities	4,684	4,895	4,078	4.54%	5.33%	4.42%
Total current liabilities	15,667	16,011	13,568	15.20%	17.42%	14.69%
Long-term debt.....	20,933	12,971	13,165	20.31%	14.11%	14.25%
Long-term deferred tax liabilities.....	2,539	3,775	4,397	2.46%	4.11%	4.76%
Other long-term liabilities.....	2,841	3,278	2,972	2.76%	3.57%	3.22%
Total liabilities.....	41,980	36,035	34,102	40.73%	39.21%	36.92%
Preferred stock	—	—	—			
Common stock.....	23,411	21,781	21,536	22.71%	23.70%	23.32%
Accumulated other comprehensive income....	60	666	1,243	0.06%	0.72%	1.35%
Retained earnings.....	37,614	33,418	35,477	36.50%	36.36%	38.41%
Total stockholders' equity.....	<u>61,085</u>	<u>55,865</u>	<u>58,256</u>	<u>59.27%</u>	<u>60.79%</u>	<u>63.08%</u>
Total liabilities and stockholders' equity	<u>\$103,065</u>	<u>\$ 91,900</u>	<u>\$ 92,358</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>

* Percentages are rounded to two decimals and thus, might not sum to totals and sub-totals.

Exhibit 4B.3 ■ Common-Size Income Statements

Intel Corporation Common-Size Income Statements For year ended	Amounts (\$ millions)			Percentages		
	Dec. 26, 2015	Dec. 27, 2014	Dec. 28, 2013	Dec. 26, 2015	Dec. 27, 2014	Dec. 28, 2013
Net revenue	\$55,355	\$55,870	\$52,708	100.00%	100.00%	100.00%
Cost of sales.....	<u>20,676</u>	<u>20,261</u>	<u>21,187</u>	<u>37.35%</u>	<u>36.26%</u>	<u>40.20%</u>
Gross margin	34,679	35,609	31,521	62.65%	63.74%	59.80%
Research and development.....	12,128	11,537	10,611	21.91%	20.65%	20.13%
Marketing, general and administrative.....	7,930	8,136	8,088	14.33%	14.56%	15.34%
Restructuring and asset impairment charges	354	295	240	0.64%	0.53%	0.46%
Amortization of acquisition-related intangibles.....	<u>265</u>	<u>294</u>	<u>291</u>	<u>0.48%</u>	<u>0.53%</u>	<u>0.55%</u>
Operating expenses.....	<u>20,677</u>	<u>20,262</u>	<u>19,230</u>	<u>37.35%</u>	<u>36.27%</u>	<u>36.48%</u>
Operating income.....	14,002	15,347	12,291	25.29%	27.47%	23.32%
Interest and other expense (income)	(105)	43	(151)	(0.19)%	0.08%	(0.27)%
Losses (gains) on equity investments, net	(315)	(411)	(471)	(0.57)%	(0.74)%	(0.89)%
Income before taxes.....	14,212	15,801	12,611	25.67%	28.28%	23.93%
Provision for taxes	<u>2,792</u>	<u>4,097</u>	<u>2,991</u>	<u>5.04%</u>	<u>7.33%</u>	<u>5.67%</u>
Net income.....	<u>\$11,420</u>	<u>\$11,704</u>	<u>\$10,9620</u>	<u>20.63%</u>	<u>20.95%</u>	<u>18.25%</u>

Limitations of Ratio Analysis

The quality of financial statement analysis depends on the quality of financial information. We ought not blindly analyze numbers; doing so can lead to faulty conclusions and suboptimal decisions. Instead, we need to acknowledge that current accounting rules (GAAP) have limitations, and be fully aware of the company's environment, its competitive pressures, and any structural and strategic changes. This section discusses some of the factors that limit the usefulness of financial accounting information for ratio analysis.

GAAP Limitations Several limitations in GAAP can distort financial ratios. Limitations include:

1. **Measurability.** Financial statements reflect what can be reliably measured. This results in nonrecognition of certain assets, often internally developed assets, the very assets that are most likely to confer a competitive advantage and create value. Examples are brand name, a superior management team, employee skills, and a reliable supply chain.
2. **Non-capitalized costs.** Related to the concept of measurability, is the expensing of costs relating to "assets" that cannot be identified with enough precision to warrant capitalization. Examples are brand equity costs from advertising and other promotional activities, and research and development costs relating to future products.
3. **Historical costs.** Assets and liabilities are usually recorded at original acquisition or issuance costs. Subsequent increases in value are not recorded until realized, and declines in value are only recognized if deemed permanent.

Thus, GAAP balance sheets omit important and valuable assets. Our analysis of ROE and our assessment of liquidity and solvency, must consider that assets can be underreported and that ratios can be distorted. We discuss many of these limitations in more detail in later modules.

Company Changes Many companies regularly undertake mergers, acquire new companies, and divest subsidiaries. Such major operational changes can impair the comparability of company ratios across time. Companies also change strategies, such as product pricing, R&D, and financing. We must understand the effects of such changes on ratios and exercise caution when we compare ratios from one period to the next. Companies also behave differently at different points in their life cycles. For instance, growth companies possess a different profile than do mature companies. Seasonal effects also markedly impact analysis of financial statements at different times of the year. Thus, we must consider life cycle and seasonality when we compare ratios across companies and over time.

Conglomerate Effects Few companies are a pure-play; instead, most companies operate in several businesses or industries. Most publicly traded companies consist of a parent company and multiple subsidiaries, often pursuing different lines of business. Most heavy equipment manufacturers, for example, have finance subsidiaries ([Ford Credit Corporation](#) and [Caterpillar Financial Services Corporation](#)) are subsidiaries of [Ford](#) and [Caterpillar](#).

Credit Corporation and **Caterpillar Financial Services Corporation** are subsidiaries of **Ford** and **Caterpillar** respectively). Financial statements of such conglomerates are consolidated and include the financial statements of the parent and its subsidiaries. Consequently, such consolidated statements are challenging to analyze. Typically, analysts break the financials apart into their component businesses and separately analyze each component. Fortunately, companies must report financial information (albeit limited) for major business segments in their 10-Ks.

Fuzzy View Ratios reduce, to a single number, the myriad complexities of a company's operations. No scalar can accurately capture all qualitative aspects of a company. Ratios cannot meaningfully convey a company's marketing and management philosophies, its human resource activities, its financing activities, its strategic initiatives, and its product management. In our analysis we must learn to look through the numbers and ratios to better understand the operational factors that drive financial results. Successful analysis seeks to gain insight into what a company is really about and what the future portends. Our overriding purpose in analysis is to understand the past and present to better predict the future. Computing and examining ratios is one step in that process.

LO9 Review 4-9

Use the income statement and balance sheet for **Cisco Systems Inc.** from Reviews 4-4 and 4-5.



Required

- a. Compute and interpret measures of liquidity for fiscal 2015 and 2014.
- b. Compute and interpret liabilities-to-equity ratio for fiscal 2015 and 2014. Compute times interest earned for 2015. (Note: The times interest earned ratio uses interest expense, gross, which is what Cisco Systems reports separately on its income statement.)

Solution on p. 4-66.

Guidance Answers

You Are the CEO

Pg. 4-28 Your company is performing substantially better than its competitors. Namely, your RNOA of 16% is markedly superior to competitors' RNOA of 10%. However, RNOA disaggregation shows that this is mainly attributed to your NOAT of 0.89 versus competitors' NOAT of 0.59. Your NOPM of 18% is essentially identical to competitors' NOPM of 17%. Accordingly, you will want to maintain your NOAT as further improvements are probably difficult to achieve. Importantly, you are likely to achieve the greatest benefit with efforts at improving your NOPM of 18%, which is only marginally better than the industry norm of 17%.

Superscript ^{A(B)} denotes assignments based on Appendix 4A (4B).

Questions

- Q4-1.** Explain in general terms the concept of return on investment. Why is this concept important in the analysis of financial performance?
- Q4-2.^A** (a) Explain how an increase in financial leverage can increase a company's ROE. (b) Given the potentially positive relation between financial leverage and ROE, why don't we see companies with 100% financial leverage (entirely nonowner financed)?
- Q4-3.** Gross profit margin (Gross profit/Sales) is an important determinant of NOPAT. Identify two factors that can cause gross profit margin to decline. Is a reduction in the gross profit margin always bad news? Explain.
- Q4-4.** When might a reduction in operating expenses as a percentage of sales denote a short-term gain at the cost of long-term performance?
- Q4-5.** Describe the concept of asset turnover. What does the concept mean and why is it so important to understanding and interpreting financial performance?
- Q4-6.** Explain what it means when a company's ROE exceeds its RNOA. What about when the reverse occurs?
- Q4-7.** Discontinued operations are typically viewed as a nonoperating activity in the analysis of the balance sheet and the income statement. What is the rationale for this treatment?

- Q4-8.** Describe what is meant by the “tax shield.”
- Q4-9.** What is meant by the term “net” in net operating assets (NOA)?
- Q4-10.** Why is it important to disaggregate RNOA into net operating profit margin (NOPM) and net operating assets turnover (NOAT)?
- Q4-11.** What insights do we gain from the graphical relation between profit margin and asset turnover?
- Q4-12.** Explain the concept of liquidity and why it is crucial to company survival.
- Q4-13.** Identify at least two factors that limit the usefulness of ratio analysis.
- Q4-14.** Define (1) net nonoperating obligations and (2) net nonoperating expense.
- Q4-15.** What is the chief difference between the traditional DuPont disaggregation of ROE and the disaggregation based on RNOA?
- Q4-16.** What is meant by the term cash conversion cycle?
- Q4-17.** What insights can be gained from a common-sized income statement or balance sheet?

Assignments with the  logo in the margin are available in *BusinessCourse*.
See the Preface of the book for details.

Mini Exercises

LO1 M4-18. Compute ROE

Home Depot (HD)



Selected balance sheet and income statement information for **Home Depot** follows. Compute the return on equity for the year ended January 31, 2016.

\$ millions	Jan. 31, 2016	Feb. 01, 2015
Operating assets.....	\$40,333	\$38,223
Nonoperating assets.....	2,216	1,723
Total assets.....	42,549	39,946
Operating liabilities.....	14,918	13,427
Nonoperating liabilities.....	21,315	17,197
Total liabilities.....	36,233	30,624
Total stockholders' equity.....	6,316	9,322
Sales.....	88,519	
Net operating profit before tax (NOPBT).....	11,774	
Nonoperating expense before tax.....	753	
Tax expense.....	4,012	
Net income.....	7,009	

LO2, 3

Home Depot (HD)



M4-19. Apply DuPont Disaggregation of ROE

Refer to the balance sheet and income statement information for **Home Depot**, from M4-18.

- Compute ROE and disaggregate the ratio into its DuPont components of ROA and financial leverage.
- Disaggregate ROA into profitability and productivity components.

LO4

Home Depot (HD)



M4-20. Compute Net Operating Assets (NOA)

Refer to the balance sheet information for **Home Depot**, from M4-18. Compute net operating assets for the years ended January 31, 2016 and February 1, 2015.

LO5

Home Depot (HD)



M4-21. Compute Net Operating Profit after Tax

Refer to the income statement information for **Home Depot**, from M4-18.

Compute net operating profit after tax for the year ended January 31, 2016. Assume a statutory tax rate of 37%.

M4-22. Compute ROE and RNOA with DisaggregationRefer to the balance sheet and income statement information for **Home Depot** from M4-18.**LO1, 6, 7**
Home Depot (HD)

- Compute return on equity.
- Compute return on net operating assets (RNOA).
- Use ROE and RNOA to determine the nonoperating return for the year.
- Disaggregate RNOA into components of profitability and productivity and show that the product of the two components equals RNOA.

**M4-23. Compute RNOA, Net Operating Profit Margin, and NOA Turnover**Selected balance sheet and income statement information for **Nordstrom Inc.**, a department store retailer, follows.**LO6, 7**
Nordstrom Inc.
(JWN)

Company (\$ millions)	Ticker	2015 Sales	2015 NOPAT	2015 Net Operating Assets	2014 Net Operating Assets
Nordstrom Inc.....	JWN	\$14,437	\$679	\$3,081	\$4,744

- Compute its 2015 return on net operating assets (RNOA).
- Disaggregate RNOA into net operating profit margin (NOPM) and net operating asset turnover (NOAT). Confirm that RNOA = NOPM × NOAT.

M4-24. Identify and Compute Net Operating AssetsFollowing is the balance sheet for **Lowe's Companies Inc.** Identify and compute its 2016 net operating assets (NOA).**LO4**
Lowe's Companies Inc.
(LOW)

\$ millions, except par value	LOWE'S COMPANIES INC. Consolidated Balance Sheets		Jan. 29, 2016	Jan. 30, 2015
Current assets				
Cash and cash equivalents		\$□□ 405	\$□□ 466	
Short-term investments		307	125	
Merchandise inventory—net		9,458	8,911	
Other current assets		391	349	
Total current assets		10,561	9,851	
Property, less accumulated depreciation.....		19,577	20,034	
Long-term investments.....		222	354	
Deferred income taxes—net		241	133	
Other assets.....		665	1,349	
Total assets.....		<u>\$31,266</u>	<u>\$31,721</u>	
Current liabilities				
Short-term borrowings		\$□□□ 43	\$□□□ —	
Current maturities of long-term debt		1,061	552	
Accounts payable.....		5,633	5,124	
Accrued compensation and employee benefits		820	773	
Deferred revenue		1,078	979	
Other current liabilities		1,857	1,920	
Total current liabilities		10,492	9,348	
Long-term debt, excluding current maturities		11,545	10,806	
Deferred revenue—extended protection plans		729	730	
Other liabilities.....		846	869	
Total liabilities.....		<u>23,612</u>	<u>21,753</u>	
Shareholders' equity				
Preferred stock—\$5 par value, none issued		—	—	
Common stock—\$0.50 par value; shares issued and outstanding 910 at January 29, 2016 and 960 at January 30, 2015, respectively .		455	480	
Capital in excess of par value		—	—	
Retained earnings.....		7,593	9,591	
Accumulated other comprehensive loss		(394)	(103)	
Total shareholders' equity		<u>7,654</u>	<u>9,968</u>	
Total liabilities and shareholders' equity		<u>\$31,266</u>	<u>\$31,721</u>	

M4-25. Identify and Compute NOPAT

Following is the income statement for **Lowe's Companies Inc.** Compute its 2016 net operating profit after tax (NOPAT) assuming a 37% total statutory tax rate.

LOWE'S COMPANIES INC. CONSOLIDATED STATEMENTS OF EARNINGS			
Twelve Months Ended (In millions)	Jan. 29, 2016	Jan. 30, 2015	Jan. 31, 2014
Net sales	\$59,074	\$56,223	\$53,417
Cost of sales.....	<u>38,504</u>	<u>36,665</u>	<u>34,941</u>
Gross margin	20,570	19,558	18,476
Expenses:			
Selling, general and administrative	14,115	13,281	12,865
Depreciation.....	1,484	1,485	1,462
Interest—net.....	<u>552</u>	<u>516</u>	<u>476</u>
Total expenses.....	<u>16,151</u>	<u>15,282</u>	<u>14,803</u>
Pre-tax earnings	4,419	4,276	3,673
Income tax provision	<u>1,873</u>	<u>1,578</u>	<u>1,387</u>
Net earnings.....	<u><u>\$2,546</u></u>	<u><u>\$2,698</u></u>	<u><u>\$2,286</u></u>

M4-26. Compute and Interpret Disaggregation of DuPont Analysis Ratios

Selected balance sheet and income statement information for **Macy's Inc.**, a retailer, follows.

Company (\$ millions)	Ticker	2015 Sales	2015 Net Income	2015 Assets	2014 Assets	2015 Stockholders' Equity	2014 Stockholders' Equity
Macy's	M	\$27,079	\$1,072	\$20,576	\$21,330	\$4,250	\$5,378

- Compute Macy's 2015 return on equity (ROE).
- Disaggregate ROE into profit margin, asset turnover, and financial leverage. Confirm that $ROE = PM \times AT \times FL$.

M4-27. Compute RNOA, Net Operating Profit Margin, and NOA Turnover for Competitors

Selected balance sheet and income statement information from **Abercrombie & Fitch Co.** and **TJX Companies Inc.** clothing retailers in the high-end and value-priced segments, respectively, follows.

Company (\$ millions)	Ticker	2015 Sales	2015 NOPAT	2015 Net Operating Assets	2014 Net Operating Assets
Abercrombie & Fitch	ANF	\$3,519	\$50	\$1,041	\$1,213
TJX Companies	TJX	30,945	2,307	3,483	3,112

- Compute the 2015 return on net operating assets (RNOA) for both companies.
- Disaggregate RNOA into net operating profit margin (NOPM) and net operating asset turnover (NOAT) for each company. Confirm that $RNOA = NOPM \times NOAT$.
- Discuss differences observed with respect to NOPM and NOAT and interpret those differences in light of each company's business model.

M4-28. Compute and Interpret Liquidity and Solvency Ratios

Selected balance sheet and income statement information from **Verizon Communications Inc.** follows.

\$ millions	2015	2014
Current assets	\$22,280	\$29,499
Current liabilities.....	35,052	27,987
Total liabilities.....	226,798	218,940
Equity	17,842	13,676
Earnings before interest and taxes	32,974	21,379
Interest expense, gross.....	4,920	4,915
Net cash flow from operating activities	38,930	30,631

- Compute the current ratio for each year and discuss any trend in liquidity. What additional information about the numbers used to calculate this ratio might be useful in helping us assess liquidity? Explain.
- Compute times interest earned and the liabilities-to-equity for each year and discuss any noticeable change. (The average liabilities-to-equity ratio for the telecommunications industry is 1.7.) Do you have any concerns about Verizon's financial leverage and the company's ability to meet interest obligations? Explain.
- Verizon's capital expenditures are expected to increase substantially as it seeks to respond to competitive pressures to upgrade the quality of its communication infrastructure. Assess Verizon's liquidity and solvency in light of this strategic direction.

M4-29. Compute NOPAT

Selected income statement information for 2015 is presented below for **Home Depot Inc.** and **Lowe's Companies Inc.**

LO5, 7

Home Depot Inc. (HD)
Lowe's Companies Inc. (LOW)

Company (\$ millions)	Ticker	Net Operating Profit Before Tax	Pretax Net Nonoperating Expense	Tax Expense	Statutory Tax Rate	Sales
Home Depot.....	HD	\$11,774	\$753	\$4,012	37%	\$88,519
Lowe's	LOW	4,971	552	1,873	37%	59,074

- Compute NOPAT for each company.
- Compute NOPAT as a percent of sales for each company—referred to as NOPM.

M4-30. Compute and Interpret Measures for DuPont Disaggregation Analysis

Refer to the 2012 fiscal year financial data of **3M Company** from Problem 4-41 to answer the following requirements (perform these computations from the perspective of a 3M shareholder).

LO1, 2, 3

3M Company (MMM)



- Compute the DuPont model component measures for profit margin, asset turnover, and financial leverage. Then, compute ROA.
- Compute ROE. Confirm that ROE equals ROE computed using the component measures from part a ($ROE = PM \times AT \times FL$).
- Compute adjusted ROA (assume a statutory tax rate of 37% and pretax net interest expense of \$123).

Exercises

E4-31. Compute and Interpret RNOA, Profit Margin, and Asset Turnover of Competitors

Selected balance sheet and income statement information for drug store retailers **CVS Health Corp.** and **Walgreens Boots Alliance** follows.

LO6, 7

CVS Health Corp (CVS)

Walgreens Boots Alliance (WBA)



Company (\$ millions)	Ticker	2015 Sales	2015 NOPAT	2015 Net Operating Assets	2014 Net Operating Assets
CVS Health.....	CVS	\$153,290	\$5,758	\$62,159	\$48,338
Walgreens Boots Alliance	WBA	□103,444	□3,642	□42,683	□22,461

- Compute the 2015 return on net operating assets (RNOA) for each company.
- Disaggregate RNOA into net operating profit margin (NOPM) and net operating asset turnover (NOAT) for each company.
- Discuss any differences in these ratios for each company.

E4-32. Compute, Disaggregate, and Interpret RNOA of Competitors

Selected balance sheet and income statement information for the clothing retailers, **Abercrombie & Fitch Co.** and **The GAP Inc.** follows.

LO6, 7

Abercrombie & Fitch Co. (ANF)

The GAP Inc. (GPS)



Company (\$ millions)	Ticker	2015 Sales	2015 NOPAT	2015 Net Operating Assets	2014 Net Operating Assets
Abercrombie & Fitch ..	ANF	\$ 3,519	\$ 50	\$ 1,041	\$ 1,213
The GAP	GPS	15,797	953	3,989	3,962

- a. Compute the 2015 return on net operating assets (RNOA) for each company.
- b. Disaggregate RNOA into net operating profit margin (NOPM) and net operating asset turnover (NOAT) for each company.
- c. Discuss any differences in these ratios for each company.

LO6, 7

Nordstrom Inc. (JWN)
L Brands Inc. (LB)

E4-33. Compute, Disaggregate, and Interpret RNOA of Competitors

Selected balance sheet and income statement information for the clothing retailers **Nordstrom Inc.** and **L Brands Inc.** follows.

Company (\$ millions)	Ticker	2015 Sales	2015 NOPAT	2015 Net Operating Assets	2014 Net Operating Assets
Nordstrom.....	JWN	\$14,095	\$ 679	\$3,081	\$4,744
L Brands	LTD	12,154	1,416	2,915	3,060

- a. Compute the 2015 return on net operating assets (RNOA) for each company.
- b. Disaggregate RNOA into net operating profit margin (NOPM) and net operating asset turnover (NOAT) for each company.
- c. Discuss any differences in these ratios for each company. Identify the factor(s) that drives the differences in RNOA observed from your analyses in parts *a* and *b*.

LO1, 2, 3

Oracle (ORCL)



E4-34. Disaggregate Traditional DuPont ROE

Selected balance sheet and income statement information for **Oracle Corporation** follows. (Perform the required computations from the perspective of an Oracle shareholder.)

\$ millions	May 31, 2015	May 31, 2014
Operating assets.....	\$ 56,535	\$ 51,447
Nonoperating assets	54,368	38,819
Total assets.....	110,903	90,266
Operating liabilities	19,847	18,722
Nonoperating liabilities.....	41,958	24,097
Total liabilities.....	61,805	42,819
Total Oracle stockholders' equity.....	48,663	\$46,878
Total revenues	38,226	
Operating income before tax.....	13,871	
Nonoperating expense before tax	1,037	
Tax expense	2,896	
Net income.....	9,938	

- a. Compute return on equity (ROE).
- b. Apply the DuPont disaggregation into return on assets (ROA) and financial leverage.
- c. Calculate the profitability and productivity components of ROA.
- d. Confirm the ROA from part *a*, above with the full DuPont disaggregation: $ROE = PM \times AT \times FL$.

LO1, 6, 7

Macy's Inc. (M)

E4-35. Compute, Disaggregate and Interpret ROE and RNOA

Selected balance sheet and income statement information from **Macy's Inc.** follows (\$ millions). (Perform the required computations from the perspective of Macy's shareholders.)

Company	Ticker	2015 Sales	2015 Net Income	2015 Net Operating Profit After Tax	2015 Net Operating Assets	2014 Net Operating Assets	2015 Stockholders' Equity	2014 Stockholders' Equity
Macy's	M	\$27,079	\$1,072	\$1,297	\$10,781	\$10,441	\$4,250	\$5,378

- a. Compute the 2015 return on equity (ROE) and 2015 return on net operating assets (RNOA).
- b. Disaggregate RNOA into net operating profit margin (NOPM) and net operating asset turnover (NOAT). What observations can we make about Macy's NOPM and NOAT?
- c. Compute the percentage of RNOA to ROE, and compute Macy's nonoperating return for 2015.

E4-36. Compute and Compare ROE, ROA, and RNOA

Refer to the balance sheet and income statement information for [Oracle Corporation](#) in E4-34.

LO1, 2, 6
[Oracle \(ORCL\)](#)



E4-37. Compute and Interpret Liquidity and Solvency Ratios

Selected balance sheet and income statement information from [Comcast Corporation](#) for 2015 and 2014 follows (\$ millions).

LO9
[Comcast Corporation \(CMCSA\)](#)



	Total Current Assets	Total Current Liabilities	Income Before Interest and Taxes	Interest Expense	Total Liabilities*	Stockholders' Equity
2015.....	\$12,303	\$18,178	\$15,673	\$2,702	\$112,596	\$53,978
2014.....	13,531	17,410	15,001	2,617	106,118	53,068

*Includes redeemable noncontrolling interests

- a. Compute the current ratio for each year and discuss any trend in liquidity. Do you believe the company is sufficiently liquid? Explain. What additional information about the accounting numbers comprising this ratio might be useful in helping you assess liquidity? Explain.
- b. Compute times interest earned and the liabilities-to-equity ratio for each year and discuss any noticeable change.
- c. What is your overall assessment of the company's liquidity and solvency from the analyses in parts a and b? Explain. Hint: Compare the ratios for Comcast to those provided in the module for publicly traded companies.

E4-38. Compute and Interpret Liquidity and Solvency Ratios

Selected balance sheet and income statement information from [Verizon Communications Inc.](#) for 2012 and 2011 follows (\$ millions).

LO9
[Verizon Communications Inc. \(VZ\)](#)

	Total Current Assets	Total Current Liabilities	Income Before Interest and Taxes	Interest Expense, Gross	Total Liabilities	Stockholders' Equity
2015.....	\$22,280	\$35,052	\$32,974	\$4,920	\$226,798	\$17,842
2014.....	29,499	27,987	21,379	4,915	218,940	13,676

- a. Compute the current ratio for each year and discuss any trend in liquidity. Do you believe the company is sufficiently liquid? Explain. What additional information about the accounting numbers comprising this ratio might be useful in helping you assess liquidity? Explain.
- b. Compute times interest earned and the liabilities-to-equity ratio for each year and discuss any noticeable change.
- c. What is your overall assessment of the company's liquidity and solvency from the analyses in parts a and b? Explain.

LO9General Electric
Company (GE)**E4-39. Compute and Interpret Solvency Ratios for Business Segments**

Selected balance sheet and income statement information from **General Electric Company** and its two principal business segments (Industrial and Financial) for 2015 follows.

\$ millions	Pretax Income	Interest Expense	Total Liabilities	Stockholders' Equity
Industrial segment	\$3,252	\$1,706	\$223,910 ³	\$199,651
Financial segment	(2,739)	2,301	265,411	46,713
Other.....	<u>7,673¹</u>	<u>(544)²</u>	<u>(96,767)</u>	<u>(46,226)</u>
General Electric Consolidated.....	<u><u>\$8,186</u></u>	<u><u>\$3,463</u></u>	<u><u>\$392,554</u></u>	<u><u>\$100,138⁴</u></u>

¹ Includes unallocated corporate operating activities.² Includes intercompany loans and related interest expense; these are deducted (eliminated) in preparing consolidated financial statements.³ Includes redeemable noncontrolling interests⁴ Includes noncontrolling interests.

- Compute times interest earned and the liabilities-to-equity ratio for 2015 for the two business segments (Industrial and Financial) and the company as a whole.
- What is your overall assessment of the company's solvency? Explain. What differences do you observe between the two business segments? Do these differences correspond to your expectations given each company's business model?
- Discuss the implications of the analysis of consolidated financial statements and the additional insight that can be gained from a more in-depth analysis of primary business segments.

LO5**E4-40. Compute NOPAT Using Tax Rates from Tax Footnote**

The income statement for **TJX Companies** follows.



TJX COMPANIES Consolidated Statements of Income	
Fiscal Year Ended (\$ thousands)	January 30, 2016
Net sales	\$30,944,938
Cost of sales, including buying and occupancy costs.....	22,034,523
Selling, general and administrative expenses	5,205,715
Interest expense, net	<u>46,400</u>
Income before provision for income taxes	3,658,300
Provision for income taxes.....	<u>1,380,642</u>
Net income.....	<u><u>\$12,277,658</u></u>

TJX provides the following footnote disclosure relating to its effective tax rate.

January 30, 2016	
U.S. federal statutory income tax rate.....	35.0%
Effective state income tax rate	3.5%
Impact of foreign operations.....	(0.7)%
All other.....	(0.1)%
Worldwide effective income tax rate.....	37.7%

- Compute TJX's 2015 statutory tax rate using its income tax footnote disclosure.
- Compute TJX's NOPAT for fiscal year 2015 using its tax rate from part *a*.

P4-41. Analysis and Interpretation of Profitability

Balance sheets and income statements for **3M Company** follow.**LO4, 5, 6, 7, 8**

3M Company (MMM)



For Years Ended Dec. 31 (\$ millions)	2015	2014	2013
Net sales	\$30,274	\$31,821	\$30,871
Operating expenses			
Cost of sales	15,383	16,447	16,106
Selling, general and administrative expenses	6,182	6,469	6,384
Research, development and related expenses	1,763	1,770	1,715
Total operating expenses	<u>23,328</u>	<u>24,686</u>	<u>24,205</u>
Operating income	<u>6,946</u>	<u>7,135</u>	<u>6,666</u>
Interest expense and income			
Interest expense	149	142	145
Interest income	(26)	(33)	(41)
Total interest expense—net	<u>123</u>	<u>109</u>	<u>104</u>
Income before income taxes	6,823	7,026	6,562
Provision for income taxes	<u>1,982</u>	<u>2,028</u>	<u>1,841</u>
Net income including noncontrolling interest	<u>□4,841</u>	<u>□4,998</u>	<u>□4,721</u>
Less: Net income attributable to noncontrolling interest	<u>8</u>	<u>42</u>	<u>62</u>
Net income attributable to 3M	<u><u>\$□4,833</u></u>	<u><u>\$□4,956</u></u>	<u><u>\$□4,659</u></u>

At December 31 (\$ millions, except per share amount)	2015	2014
Current assets		
Cash and cash equivalents	\$□1,798	\$ 1,897
Marketable securities—current	118	1,439
Accounts receivable—net of allowances of \$91 and \$94	4,154	4,238
Inventories:		
Finished goods	1,655	1,723
Work in process	1,008	1,081
Raw materials and supplies	855	902
Total inventories	3,518	3,706
Other current assets	1,398	1,023
Total current assets	10,986	12,303
Marketable securities—noncurrent	9	15
Investments	117	102
Property, plant and equipment	23,098	22,841
Less: Accumulated depreciation	<u>(14,583)</u>	<u>(14,352)</u>
Property, plant and equipment—net	8,515	8,489
Goodwill	9,249	7,050
Intangible assets—net	2,601	1,435
Prepaid pension benefits	188	46
Other assets	<u>1,053</u>	<u>1,769</u>
Total assets	<u><u>\$32,718</u></u>	<u><u>\$31,209</u></u>

continued

At December 31 (\$ millions, except per share amount)	2015	2014
Liabilities		
Current liabilities		
Short-term borrowings and current portion of long-term debt	\$ 2,044	\$ 106
Accounts payable.....	1,694	1,807
Accrued payroll.....	644	732
Accrued income taxes.....	332	435
Other current liabilities.....	2,404	2,884
Total current liabilities.....	7,118	5,964
Long-term debt.....	8,753	6,705
Pension and postretirement benefits	3,520	3,843
Other liabilities.....	1,580	1,555
Total liabilities	<u>\$20,971</u>	<u>\$18,067</u>
Equity		
3M Company shareholders' equity:		
Common stock, par value \$0.01 per share;		
Shares outstanding—2015: 609,330,124;		
Shares outstanding—2014: 635,134,594.....	\$ 000 0 9	\$ 9
Additional paid-in capital.....	4,791	4,379
Retained earnings.....	36,575	34,317
Treasury stock	(23,308)	(19,307)
Accumulated other comprehensive income (loss).....	(6,359)	(6,289)
Total 3M Company shareholders' equity.....	11,708	13,109
Noncontrolling interest	39	33
Total equity.....	<u>\$11,747</u>	<u>\$13,142</u>
Total liabilities and equity.....	<u>\$32,718</u>	<u>\$31,209</u>

Required

- Compute net operating profit after tax (NOPAT) for 2015. Assume that the combined federal and state statutory tax rate is 37%.
- Compute net operating assets (NOA) for 2015 and 2014. Treat noncurrent investments as a nonoperating item.
- Compute and disaggregate 3M's RNOA into net operating profit margin (NOPM) and net operating asset turnover (NOAT) for 2015. Demonstrate that $RNOA = NOPM \times NOAT$.
- Compute net nonoperating obligations (NNO) for 2015 and 2014. Confirm the relation: $NOA = NNO + \text{Total equity}$.
- Compute return on equity (ROE) for 2015.
- What is the nonoperating return component of ROE for 2015?
- Comment on the difference between ROE and RNOA. What inference can we draw from this comparison?

LO1, 2, 3
Under Armour Inc.
(UA)

P4-42. Compute the DuPont Disaggregation of ROERefer to the balance sheets and income statement below for **Under Armour Inc.**

UNDER ARMOUR INC.	
Consolidated Statements of Income	
For 12 Months Ended (\$ in 000s)	Dec. 31, 2015
Net revenues	\$ 3,963,313
Cost of goods sold	<u>2,057,766</u>
Gross profit.....	1,905,547
Selling, general and administrative expenses	<u>1,497,000</u>
Income from operations	408,547
Interest expense, net	(14,628)
Other expense, net.....	<u>(7,234)</u>
Income before income taxes.....	386,685
Provision for income taxes.....	<u>154,112</u>
Net income.....	<u>\$ 232,573</u>

**UNDER ARMOUR INC.
Consolidated Balance Sheet**

\$ in 000s	Dec. 31, 2015	Dec. 31, 2014
Assets		
Cash and cash equivalents	\$ 129,852	\$ 593,175
Accounts receivable, net	433,638	279,835
Inventories	783,031	536,714
Prepaid expenses and other current assets	152,242	87,177
Deferred income taxes	—	52,498
Total current assets	1,498,763	1,549,399
Property and equipment, net	538,531	305,564
Goodwill	585,181	123,256
Intangible assets, net	75,686	26,230
Deferred income taxes	92,157	33,570
Other long-term assets	78,582	57,064
Total assets	<u>\$2,868,900</u>	<u>\$2,095,083</u>
Liabilities and Stockholders' Equity		
Accounts payable	\$ 200,460	\$ 210,432
Accrued expenses	192,935	147,681
Current maturities of long term-debt	42,000	28,951
Other current liabilities	43,415	34,563
Total current liabilities	478,810	421,627
Long-term debt, net of current maturities	352,000	255,250
Long-term line of credit, noncurrent	275,000	—
Other long-term liabilities	94,868	67,906
Total liabilities	<u>1,200,678</u>	<u>744,783</u>
Stockholders' equity		
Additional paid-in capital	636,630	508,350
Retained earnings	1,076,533	856,687
Accumulated other comprehensive loss	(45,013)	(14,808)
Total stockholders' equity	<u>1,668,222</u>	<u>1,350,300</u>
Total liabilities and stockholders' equity	<u>\$2,868,900</u>	<u>\$2,095,083</u>

Required

- a. Compute return on equity (ROE).
- b. Apply the DuPont disaggregation into return on assets (ROA) and financial leverage.
- c. Calculate the profitability and productivity components of ROA.
- d. Confirm the ROA from part a. above with the full DuPont disaggregation: $ROE = PM \times AT \times FL$.

P4-43. Analysis and Interpretation of Liquidity and Solvency

LO9

3M Company (MMM)

Required

- a. Compute the current ratio and quick ratio for 2015 and 2014. Comment on any observed trends.
- b. Compute times interest earned and liabilities-to-equity ratios for 2015 and 2014. Comment on any noticeable changes.
- c. Summarize your findings about the company's liquidity and solvency. Do you have any concerns about its ability to meet its debt obligations?

P4-44. Direct Computation of Nonoperating Return

LO8

3M Company (MMM)

Required

- a. Compute its financial leverage (FLEV), Spread, and noncontrolling interest (NCI) ratio for 2015. Recall that $NNE = NOPAT - \text{Net income}$.
- b. Assume that its return on equity (ROE) for 2015 is 38.95% and its return on net operating assets (RNOA) is 26.58%. Confirm computations to yield the relation: $ROE = [RNOA + (FLEV \times \text{Spread})] \times \text{NCI ratio}$.
- c. What do your computations of the nonoperating return imply about the company's use of borrowed funds?



For Fiscal Years Ended (\$ millions)	Aug. 28, 2016	Aug. 30, 2015	Aug. 31, 2014
COSTCO WHOLESALE CORPORATION Consolidated Statements of Income			
Revenue			
Net sales	\$116,073	\$113,666	\$110,212
Membership fees	2,646	2,533	2,428
Total revenue	118,719	116,199	112,640
Operating expenses			
Merchandise costs	102,901	101,065	98,458
Selling, general and administrative	12,068	11,445	10,899
Preopening expenses	78	65	63
Operating income	3,672	3,624	3,220
Other income (expense)			
Interest expense	(133)	(124)	(113)
Interest income and other, net	80	104	90
Income before taxes	3,619	3,604	3,197
Provision for income taxes	1,243	1,195	1,109
Net income including noncontrolling interests	2,376	2,409	2,088
Net income attributable to noncontrolling interests	(26)	(32)	(30)
Net income attributable to Costco	\$2,350	\$ 2,377	\$ 2,058

\$ millions, except par value and share data	Aug. 28, 2016	Aug. 30, 2015
COSTCO WHOLESALE CORPORATION Consolidated Balance Sheets		
Assets		
Current assets		
Cash and cash equivalents	\$3,379	\$4,801
Short-term investments	1,350	1,618
Receivables, net	1,252	1,224
Merchandise inventories	8,969	8,908
Other current assets	268	228
Total current assets	15,218	16,779
Property and equipment		
Land	5,395	4,961
Buildings and improvements	13,994	12,618
Equipment and fixtures	6,077	5,274
Construction in progress	701	811
Gross property and equipment	26,167	23,664
Less accumulated depreciation and amortization	(9,124)	(8,263)
Net property and equipment	17,043	15,401
Other assets	902	837
Total assets	\$33,163	\$33,017

continued

\$ millions, except par value and share data	Aug. 28, 2016	Aug. 30, 2015
Liabilities and equity		
Current liabilities		
Accounts payable.....	\$ 7,612	\$ 9,011
Current portion long-term debt.....	1,100	1,283
Accrued salaries and benefits	2,629	2,468
Accrued member rewards.....	869	813
Deferred membership fees	1,362	1,269
Other current liabilities.....	2,003	1,695
Total current liabilities.....	15,575	16,539
Long-term debt, excluding current portion.....	4,061	4,852
Other liabilities.....	1,195	783
Total liabilities	<u>20,831</u>	<u>22,174</u>
Equity		
Preferred stock, \$0.005 par value:		
100,000,000 shares authorized; no shares issued and outstanding	—	—
Common stock, \$0.005 par value:		
900,000,000 shares authorized;		
437,524,000 and 437,952,000 shares issued and outstanding	2	2
Additional paid-in-capital	5,490	5,218
Accumulated other comprehensive loss.....	(1,099)	(1,121)
Retained earnings	7,686	6,518
Total Costco stockholders' equity	12,079	10,617
Noncontrolling interests.....	253	226
Total equity.....	<u>12,332</u>	<u>10,843</u>
Total liabilities and equity.....	<u>\$33,163</u>	<u>\$33,017</u>

Required

- Compute net operating profit after tax (NOPAT) for 2016. Assume that the combined federal and state statutory tax rate is 37%.
- Compute net operating assets (NOA) for 2016 and 2015.
- Compute and disaggregate Costco's RNOA into net operating profit margin (NOPM) and net operating asset turnover (NOAT) for 2016; confirm that $RNOA = NOPM \times NOAT$.
- Compute net nonoperating obligations (NNO) for 2016 and 2015. Confirm the relation: $NOA = NNO + \text{Total equity}$.
- Compute return on equity (ROE) for 2016.
- Infer the nonoperating return component of ROE for 2016.
- Comment on the difference between ROE and RNOA. What does this relation suggest about Costco's use of equity capital?

P4-46. Analysis and Interpretation of Liquidity and Solvency

Refer to the financial information of **Costco Wholesale Corporation** in P4-45 to answer the following requirements.

Required

- Compute Costco's current ratio and quick ratio for 2016 and 2015. Comment on any observed trends.
- Compute Costco's times interest earned and its liabilities-to-equity ratios for 2016 and 2015. Comment on any noticeable change.
- Summarize your findings about the company's liquidity and solvency. Do you have any concerns about Costco's ability to meet its debt obligations?

P4-47. Direct Computation of Nonoperating Return

Refer to the financial information of **Costco Wholesale Corporation** in P4-45 to answer the following requirements.

LO9

Costco Wholesale Corporation (COST)



LO8

Costco Wholesale Corporation (COST)



Required

- Compute Costco's financial leverage (FLEV), Spread, and noncontrolling interest (NCI) ratio for 2016; recall, NNE = NOPAT – Net income.
- Assume that Costco's return on equity (ROE) for 2016 is 20.71% and its return on net operating assets (RNOA) is 20.66%. Confirm computations to yield the relation: $ROE = [RNOA + (FLEV \times \text{Spread})] \times \text{NCI ratio}$.
- What do your computations of the nonoperating return in parts *a* and *b* imply about the company's use of borrowed funds?

LO1, 4, 5, 6, 7Under Armour Inc.
(UA)**P4-48. Analysis and Interpretation of Profitability**

Balance sheets and income statements for **Under Armour Inc.** are found in P4-42. Use these financial statements to answer the requirements.

Required

- Compute net operating profit after tax (NOPAT) for 2015. Assume that the combined federal and state statutory tax rate is 37%.
- Compute net operating assets (NOA) for 2015 and 2014.
- Compute RNOA and disaggregate it into net operating profit margin (NOPM) and net operating asset turnover (NOAT) for 2015. Comment on the drivers of RNOA.
- Compute return on equity (ROE) for 2015.
- Comment on the difference between ROE and RNOA. What does this relation suggest about Under Armour's use of debt?

LO1, 8Under Armour Inc.
(UA)**P4-49. Compute ROE and Nonoperating Return**

Refer to the balance sheets and income statement for **Under Armour Inc.** in P4-42. Use these financials to answer the requirements. For the 2015 fiscal year, Under Armour had a return on net operating assets (RNOA) of 15.17%.

- Compute ROE.
- Compute net nonoperating obligations (NNO).
- Compute FLEV and Spread.
- Show that $ROE = RNOA + (FLEV \times \text{Spread})$.
- What is the nonoperating return for the year? What does this suggest about Under Armour's use of debt?

LO4, 5, 6, 7, 8Nordstrom Inc.
(JWN)**P4-50. Analysis and Interpretation of Profitability**

Balance sheets and income statements for **Nordstrom Inc.**, follow. Refer to these financial statements to answer the requirements.

For Fiscal Years Ended (\$ millions)	Jan. 30, 2016	Jan. 31, 2015	Feb. 01, 2014
Net sales	\$14,095	\$13,110	\$12,166
Credit card revenues	342	396	374
Total revenues	14,437	13,506	12,540
Cost of sales and related buying and occupancy costs	(9,168)	(8,406)	(7,737)
Selling, general and administrative expenses	(4,168)	(3,777)	(3,453)
Earnings before interest and income taxes.....	1,101	1,323	1,350
Interest expense, net	(125)	(138)	(161)
Earnings before income taxes.....	976	1,185	1,189
Income tax expense	(376)	(465)	(455)
Net earnings.....	<u><u>\$1,600</u></u>	<u><u>\$1,720</u></u>	<u><u>\$1,734</u></u>

NORDSTROM INC.
Consolidated Balance Sheets

in millions	Jan. 30, 2016	Jan. 31, 2015
Assets		
Current assets		
Cash and cash equivalents	\$ 595	\$ 827
Accounts receivable, net	196	2,306
Merchandise inventories	1,945	1,733
Current deferred tax assets, net.....	—	256
Prepaid expenses and other	278	102
Total current assets	3,014	5,224
Land, buildings and equipment, net	3,735	3,340
Goodwill.....	435	435
Other assets.....	514	246
Total assets.....	<u>\$7,698</u>	<u>\$9,245</u>
Liabilities and Shareholders' Equity		
Current liabilities		
Accounts payable.....	\$1,324	\$1,328
Accrued salaries, wages and related benefits.....	416	416
Other current liabilities.....	1,161	1,048
Current portion of long-term debt.....	10	8
Total current liabilities.....	2,911	2,800
Long-term debt, net.....	2,795	3,123
Deferred property incentives, net	540	510
Other liabilities.....	581	372
Shareholders' equity		
Common stock, no par value: 1,000 shares authorized; 173.5 and 190.1 shares issued and outstanding	2,539	2,338
Retained earnings	(1,610)	166
Accumulated other comprehensive loss.....	(58)	(64)
Total shareholders' equity	<u>871</u>	<u>2,440</u>
Total liabilities and shareholders' equity	<u>\$7,698</u>	<u>\$9,245</u>

Required

- Compute net operating profit after tax (NOPAT) for 2016. Assume that the combined federal and state statutory tax rate is 37%.
- Compute net operating assets (NOA) for 2016 and 2015.
- Compute RNOA and disaggregate it into net operating profit margin (NOPM) and net operating asset turnover (NOAT) for 2016; confirm that $RNOA = NOPM \times NOAT$.
- Compute net nonoperating obligations (NNO) for 2016 and 2015. Confirm the relation: $NOA = NNO + \text{Shareholders' equity}$.
- Compute return on equity (ROE) for 2016.
- Infer the nonoperating return component of ROE for 2016.
- Comment on the difference between ROE and RNOA. What does this relation suggest about Nordstrom's use of equity capital?

P4-51. Analysis and Interpretation of Profitability

Mondelēz International Inc. is one of the world's largest snacks companies, with a brand portfolio that includes: Nabisco, Oreo, Milka, Cadbury and Trident. The company's balance sheets and income statements follow. Refer to these financial statements to answer the requirements.

For the Years Ended December 31 (in millions)	2015	2014	2013
Net revenues	\$29,636	\$34,244	\$35,299
Cost of sales.....	<u>18,124</u>	<u>21,647</u>	<u>22,189</u>
Gross profit.....	11,512	12,597	13,110
Selling, general and administrative expenses	7,577	8,457	8,679
Asset impairment and exit costs	901	692	273
Gains on coffee business transactions and divestitures.....	(6,822)	—	(30)
Loss on deconsolidation of Venezuela.....	778	—	—
Amortization of intangibles	<u>181</u>	<u>206</u>	<u>217</u>
Operating income.....	8,897	3,242	3,971
Interest and other expense, net	<u>1,013</u>	<u>688</u>	<u>1,579</u>
Earnings from continuing operations before income taxes	7,884	2,554	2,392
Provision for income taxes.....	<u>593</u>	<u>353</u>	<u>60</u>
Earnings from continuing operations	7,291	2,201	2,332
Earnings from discontinued operations, net of income taxes	—	—	1,603
Net earnings.....	7,291	2,201	3,935
Noncontrolling interest	<u>24</u>	<u>17</u>	<u>20</u>
Net earnings attributable to Mondelēz International.....	<u>\$7,267</u>	<u>\$2,184</u>	<u>\$3,915</u>

As of December 31 (in millions, except share data)	2015	2014
Assets		
Cash and cash equivalents	\$1,870	\$1,631
Trade receivables (net of allowances of \$54 at 2015 and \$66 at 2014)	2,634	3,802
Other receivables (net of allowances of \$109 at 2015 and \$91 at 2014)	1,212	949
Inventories, net	2,609	3,480
Deferred income taxes	—	480
Other current assets	<u>633</u>	<u>1,408</u>
Total current assets	8,958	11,750
Property, plant and equipment, net.....	8,362	9,827
Goodwill.....	20,664	23,389
Intangible assets, net.....	18,768	20,335
Prepaid pension assets.....	69	53
Equity method investments.....	5,387	662
Other assets	<u>635</u>	<u>755</u>
Total Assets	<u>\$62,843</u>	<u>\$66,771</u>

continued

As of December 31 (in millions, except share data)	2015	2014
Liabilities.....		
Short-term borrowings.....	\$ 2,236	\$ 1,305
Current portion of long-term debt.....	605	1,530
Accounts payable.....	4,890	5,299
Accrued marketing.....	1,634	2,047
Accrued employment costs.....	844	946
Other current liabilities.....	2,713	2,880
Total current liabilities.....	10,922	14,007
Long-term debt.....	14,557	13,821
Deferred income taxes.....	4,750	5,512
Accrued pension costs.....	2,183	2,912
Accrued postretirement health care costs.....	499	526
Other liabilities.....	1,832	2,140
Total liabilities.....	<u>\$34,743</u>	<u>\$38,918</u>
Equity		
Common stock, no par value (1,996,537,778 shares issued at 2015 and 2014).....	—	—
Additional paid-in capital.....	31,760	31,651
Retained earnings.....	20,700	14,529
Accumulated other comprehensive losses.....	(9,986)	(7,318)
Treasury stock, at cost.....	<u>(14,462)</u>	<u>(11,112)</u>
Total Mondelēz International shareholders' equity.....	28,012	27,750
Noncontrolling interest.....	88	103
Total equity.....	<u>28,100</u>	<u>27,853</u>
Total liabilities and equity.....	<u><u>\$62,843</u></u>	<u><u>\$66,771</u></u>

Required

- Compute net operating profit after tax (NOPAT) for 2015. Assume that the combined federal and state statutory tax rate is 37%.
- Compute net operating assets (NOA) for 2015 and 2014.
- Compute RNOA and disaggregate it into net operating profit margin (NOPM) and net operating asset turnover (NOAT) for 2015; confirm that $RNOA = NOPM \times NOAT$. The median NOPM and NOAT for companies in the packaged food industry is 5% and 2.1, with a median RNOA of 10.5%. Comment on NOPM and NOAT estimates for Mondelēz in comparison to industry medians.
- Compute net nonoperating obligations (NNO) for 2015 and 2014. Confirm the relation: $NOA = NNO + \text{Total equity}$.
- Compute return on equity (ROE) for 2015.
- Infer the nonoperating return component of ROE for 2015.
- Comment on the difference between ROE and RNOA. What does this relation suggest about Mondelēz's use of debt?

P4-52. Direct Computation of Nonoperating Return

Refer to the financial information of **Mondelēz International Inc.** in P4-51 to answer the following requirements.

LO8

Mondelēz International Inc. (MDLZ)

Required

- Assume that 2015 net nonoperating expenses (NNE) are \$638 million and that NOA is \$41,628 million and \$42,878 million in 2015 and 2014, respectively. Compute financial leverage (FLEV) and Spread for 2015.
- Compute the 2015 return on equity. The NCI ratio for 2015 is 0.999. Confirm computations to yield the relation: $ROE = [RNOA + (FLEV \times \text{Spread})] \times \text{NCI ratio}$.
- What do your computations of the nonoperating return in parts *a* and *b* imply about the company's use of borrowed funds?

LO7 P4-53. Analysis and Interpretation of Profit Margin, Asset Turnover, and RNOA for Several Companies

Net operating profit margin (NOPM) and net operating asset turnover (NOAT) for several selected companies for the most recent year follow.

Abbott Laboratories (ABT)
FedEx Corp. (FDX)
CVS Health Corp. (CVS)
Mondelēz International Inc. (MDLZ)
Walgreens Boots Alliance (WBA)
Caterpillar Inc. (CAT)
Target Corp. (TGT)

	NOPM	NOAT
Abbott Laboratories	11.73%	0.95
FedEx Corp.	4.04%	3.50
CVS Health Corp.	3.76%	2.77
Mondelēz International Inc.	26.76%	0.70
Walgreens Boots Alliance Inc.	3.52%	3.18
Caterpillar Inc.	5.26%	2.96
Target Corp.	5.02%	5.47

Required

- Graph NOPM and NOAT for each of these companies. Do you see a pattern that is similar to that shown in this module? Explain. (The graph in the module is based on medians for selected industries; the graph for this problem uses fewer companies than in the module and, thus, will not be as smooth.)
- Consider the trade-off between profit margin and asset turnover. How can we evaluate companies on the profit margin and asset turnover trade-off? Explain.

LO1, 2, 3 P4-54. Compute and Analyze Measures for DuPont Disaggregation Analysis

Refer to the fiscal 2016 financial data of **Costco Wholesale Corporation** in P4-45 to answer the following requirements. (Perform the required computations from the perspective of a Costco shareholder.)

Required

- Compute ROE for fiscal 2016.
- Confirm that ROE equals ROE computed using the component measures for profit margin, assets turnover, and financial leverage using: $ROE = PM \times AT \times FL$.
- Compute adjusted ROA (assume a statutory tax rate of 37%).

LO1, 2, 3 P4-55. Compute and Analyze Measures for DuPont Disaggregation Analysis

Refer to the fiscal 2015 financial data of **Mondelēz International Inc.** in P4-51 to answer the following requirements. (Perform the required computations from the perspective of a Modelez shareholder.)

Required

- Compute ROE for fiscal 2015.
- Confirm that ROE equals ROE computed using the component measures for profit margin, assets turnover, and financial leverage using: $ROE = PM \times AT \times FL$.
- Compute adjusted ROA (assume a statutory tax rate of 37%). Compare the adjusted and unadjusted ROA ratios and explain why they differ.

IFRS Applications

LO6, 7

Shell Oil Company
Royal Dutch Shell
BP Limited

I4-56. Compute, Disaggregate, and Interpret RNOA of Competitors

Shell Oil Company is the U.S.-based subsidiary of **Royal Dutch Shell**, a multinational oil company headquartered in The Hague, The Netherlands. **BP Limited** is a multinational oil company headquartered in London U.K. Selected balance sheet and income statement information and assumptions for both Royal Dutch Shell and BP follow.

\$ millions	2015 Sales	2015 NOPAT	2015 Net Operating Assets	2014 Net Operating Assets
Royal Dutch Shell	\$272,156	\$3,389	\$187,332	\$192,604
BP Limited	225,982	(4,135)	122,238	131,457

- Compute the 2015 return on net operating assets (RNOA) for each company.
- Disaggregate RNOA into net operating profit margin (NOPM) and net operating asset turnover (NOAT) for each company.
- Discuss any differences in these ratios for each company. What drives the differences in RNOA observed in parts *a* and *b*?

14-57. Compute, Disaggregate, and Interpret ROE and RNOA

Headquartered in Calgary, Alberta, **Husky Energy Inc.** is a publicly traded, integrated energy company, with extensive conventional oil and natural gas assets, substantial heavy oil production and a range of midstream and downstream operations. Operating assets include refineries, upgrading facilities, and pipelines. Selected fiscal year balance sheet and income statement information for Husky Energy follow (Canadian \$ millions).

LO1, 6, 7
Husky Energy Inc.

2014 Sales	2014 Net Income	2014 NOPAT	2014 Net Operating Assets	2013 Net Operating Assets	2014 Stockholders' Equity	2013 Stockholders' Equity
\$25,052	\$1,258	\$1,349	\$24,300	\$20,078	\$20,575	\$20,078

- Compute the 2014 return on equity (ROE) and the 2014 return on net operating assets (RNOA).
- Disaggregate RNOA into net operating profit margin (NOPM) and net operating asset turnover (NOAT).
- Compute the percentage of RNOA to ROE, and compute Husky's nonoperating return for 2014.

14-58. Compute and Interpret Liquidity and Solvency Ratios

Headquartered in Melbourne, Australia, **BHP Billiton**, is a leading global resources company that operates in diverse commodity and geographic markets. The company is among the world's top producers of iron ore, metallurgical coal, conventional and non-conventional oil and gas, copper, energy coal, aluminum, manganese, uranium, nickel, and silver. BHP Billiton is traded on the Australian Securities Exchange (ASX) and also listed in London, Johannesburg, and New York.

LO9
BHP Billiton

\$ millions	Total Current Assets	Total Current Liabilities	Pretax Income	Interest Expense	Total Liabilities	Stockholders' Equity
2014.....	\$22,296	\$18,064	\$21,735	\$995	\$66,031	\$79,143
2015.....	16,369	12,853	8,056	702	54,035	64,768

- Compute the current ratio for each year and discuss any trend in liquidity. Is the company sufficiently liquid? Explain. What additional information about the accounting numbers comprising this ratio might be useful in helping us assess liquidity? Explain.
- Compute times interest earned and the liabilities-to-equity ratio for each year and discuss any noticeable change.
- What is the overall assessment of the company's liquidity and solvency from the analyses in parts a and b? Explain.

14-59. Analysis and Interpretation of Profitability

BT Group is one of the largest telecommunications services companies in the world, headquartered in London, United Kingdom. Balance sheets and income statements for BT Group follow.

LO4, 5, 6, 7, 8
BT Group plc

BT GROUP PLC Group Income Statement		
Year Ended March 31 (in millions)	2016	2015
Revenue.....	£19,042	£17,979
Operating costs.....	(15,307)	(14,499)
Operating profit (loss).....	3,735	3,480
Finance expense.....	(749)	(876)
Finance income.....	37	17
Net finance expense	(712)	(859)
Share of post tax profit of associates and joint ventures	6	24
Profit (loss) before taxation	3,029	2,645
Taxation	(441)	(510)
Profit (loss) for the year.....	£2,588	£2,135

BT GROUP PLC
Group Balance Sheet

At March 31 (in millions)	2016	2015
Non-current assets		
Intangible assets	£15,436	£□ 3,170
Property, plant and equipment	16,010	13,505
Derivative financial instruments	1,462	1,232
Investments	46	44
Associates and joint ventures	24	26
Trade and other receivables	233	184
Deferred tax assets	1,247	1,559
	<u>34,458</u>	<u>19,720</u>
Current assets		
Programme rights	225	118
Inventories	189	94
Trade and other receivables	4,063	3,140
Current tax receivable	65	65
Derivative financial instruments	177	97
Investments	2,918	3,523
Cash and cash equivalents	497	434
	<u>8,134</u>	<u>7,471</u>
Current liabilities		
Loans and other borrowings	3,237	1,900
Derivative financial instruments	48	168
Trade and other payables	7,289	5,276
Current tax liabilities	271	222
Provisions	171	142
	<u>11,016</u>	<u>7,708</u>
Total assets less current liabilities	<u>£31,576</u>	<u>£19,483</u>
Non-current liabilities		
Loans and other borrowings	£11,032	£□ 7,868
Derivative financial instruments	863	927
Retirement benefit obligations	6,382	7,583
Other payables	1,105	927
Deferred tax liabilities	1,262	948
Provisions	552	422
	<u>21,196</u>	<u>18,675</u>
Equity		
Ordinary shares	499	419
Share premium	1,051	1,051
Own shares	(115)	(165)
Merger reserve	8,422	998
Other reserves	690	487
Retained loss	(167)	(1,982)
	<u>10,380</u>	<u>808</u>
Total equity	<u>£31,576</u>	<u>£19,483</u>

Required

- Compute net operating profit after tax (NOPAT) for 2016. Assume that the tax rate is 20%, which is the statutory rate for the U.K.
- Compute net operating assets (NOA) for 2016 and 2015.
- Compute and disaggregate RNOA into net operating profit margin (NOPM) and net operating asset turnover (NOAT) for 2016.
- Compute net nonoperating obligations (NNO) for 2016 and 2015. Confirm the relation: NOA = NNO + Total equity.
- Compute return on equity (ROE) for 2016.

- f. What is the nonoperating return component of ROE for 2016?
g. Comment on the difference between ROE and RNOA. What inference can we draw from this comparison?

I4-60. Analysis and Interpretation of Liquidity and Solvency

BT Group is one of the largest telecommunications services companies in the world, headquartered in London, United Kingdom. Refer to the financial information for BT Group in I4-59 to answer the following requirements.

LO9
BT Group plc

Required

- a. Compute the current ratio and quick ratio for 2016 and 2015. Comment on any observed trends.
- b. Compute times interest earned and liabilities-to-equity ratios for 2016 and 2015. Comment on any noticeable changes.
- c. Summarize the findings about the company's liquidity and solvency. Do we have any concerns about its ability to meet its debt obligations?

Management Applications

MA4-61. Gross Profit and Strategic Management

LO3

One way to increase overall profitability is to increase gross profit. This can be accomplished by raising prices and/or by reducing manufacturing costs.

Required

- a. Will raising prices and/or reducing manufacturing costs unambiguously increase gross profit? Explain.
- b. What strategy might you develop as a manager to (i) increase product prices, or (ii) reduce product manufacturing cost?

MA4-62. Asset Turnover and Strategic Management

LO3

Increasing net operating asset turnover requires some combination of increasing sales and/or decreasing net operating assets. For the latter, many companies consider ways to reduce their investment in working capital (current assets less current liabilities). This can be accomplished by reducing the level of accounts receivable and inventories, or by increasing the level of accounts payable.

Required

- a. Develop a list of suggested actions that you, as a manager, could undertake to achieve these three objectives.
- b. Describe the marketing implications of reducing receivables and inventories, and the supplier implications of delaying payment. How can a company reduce working capital without negatively impacting its performance?

MA4-63. Ethics and Governance: Earnings Management

LO3

Companies are aware that analysts focus on profitability in evaluating financial performance. Managers have historically utilized a number of methods to improve reported profitability that are cosmetic in nature and do not affect "real" operating performance. These methods are subsumed under the general heading of "earnings management." Justification for such actions typically includes the following arguments:

- Increasing stock price by managing earnings benefits stockholders; thus, no one is hurt by these actions.
- Earnings management is a temporary fix; such actions will be curtailed once "real" profitability improves, as managers expect.

Required

- a. Identify the affected parties in any scheme to manage profits to prop up stock price.
- b. Do the ends (of earnings management) justify the means? Explain.
- c. To what extent are the objectives of managers different from those of stockholders?
- d. What governance structure can you envision that might inhibit earnings management?

Ongoing Project

(This ongoing project began in Module 1 and continues through most of the book; even if previous segments were not completed, the requirements are still applicable to any business analysis.)

Analysis of financial statements commonly includes ROE disaggregation and scrutiny of its components as explained in this module.

1. Compute ROE for all three years reported on the income statement. (*Hint:* Do your companies report noncontrolling interest on the income statement and balance sheet? If so, make certain to use income available to the controlling interest (NICI) in the numerator and equity of the controlling interest (CI) in the denominator. To compute ROE for three years, we must determine average stockholders' equity for three years, which means we need four balance sheet amounts. Because the balance sheets of each company will report only two years, we must collect prior years' financial statements.)
2. Compute RNOA and its two components (NOPM and NOAT) for all three years reported on the income statement. We must use balance sheet numbers for four years to obtain three averages of net operating assets. Examine the income statements and balance sheets to determine the operating and nonoperating items. (*Hint:* Use an online source to understand any line items not described in the textbook. Use cell references in the spreadsheet to compute NOPAT and NOA and the various ratios.)

Compare ROE and RNOA and identify differences over time and between the companies. Evaluate the companies' returns and answer questions such as the following:

- Which company is more profitable?
 - How do the operating and nonoperating portions of ROE compare?
 - Compare the ROE and RNOA with the graph on page 4-26. If the ratios for the companies under analysis differ from the graph, is there an explanation?
 - Is the net operating profit margin similar for the two companies? Given that they are roughly in the same industry, major differences should prompt further exploration.
 - Are the companies' net operating asset turnover ratios similar or markedly different? Calculate and compare the cash conversion cycle for each year.
3. Determine FLEV and Spread and the noncontrolling interest ratio (if applicable). Show that:

$$\text{ROE} = [\text{RNOA} + (\text{FLEV} \times \text{Spread})] \times \text{Noncontrolling interest ratio}$$

Compare the components of the equation for each company over time and follow up on any differences.

4. Compute the four ratios from Appendix 4B for the recent three years for each company: current ratio, quick ratio, liabilities-to-equity, and times interest earned. Compare the ratios for the companies under analysis and identify differences over time and between companies. Evaluate each company's ability to pay its debts in the short term (liquidity) and the long term (solvency), and in the process address the following:

- Which company is more liquid? More solvent?
- Look at the bar chart in Exhibit 4B.1. If the ratios differ from the industry norm, is there an explanation(s)?
- Do the ratios change over time? If yes, does the change make sense given the economic and competitive factors that affect the industry and the companies?

Review 4-1—Solution (\$ millions)

$$\text{ROA} = \frac{\$8,981}{(\$59,698 + \$56,654) / 2} = 15.44\%$$

Review 4-2—Solution (\$ millions)

ROE = Return on assets (ROA) × Financial leverage

$$\text{ROA} = \frac{\$8,981}{(\$113,481 + \$105,070) / 2} = 8.22\% \quad \text{Financial leverage} = \frac{(\$113,481 + \$105,070) / 2}{(\$59,698 + \$56,654) / 2} = 1.878$$

$$8.22\% \times 1.878 = 15.44\% = \text{ROE}$$

Review 4-3—Solution (\$ millions)

$$a. \text{ ROA} = \frac{\$8,981}{(\$113,481 + \$105,070) / 2} = 8.22\%$$

$$\text{PM} = \frac{\$8,981}{\$49,161} = 18.27\%$$

$$\text{AT} = \frac{\$49,161}{(\$113,481 + \$105,070) / 2} = 0.45$$

ROA = Profit Margin (PM) × Asset Turnover (AT)

$$8.22\% = 18.27\% \times 0.45$$

$$b. (\$49,161 - \$19,480) / \$49,161 = 60.38\%$$

$$c. \text{ Days sales outstanding} = 365 \times [(\$5,344 + \$5,157) / 2] / \$49,161 = 38.98$$

$$\text{Days inventory outstanding} = 365 \times [(\$1,627 + \$1,591) / 2] / \$19,480 = 30.15$$

$$\text{Days accounts payable outstanding} = 365 \times [(\$1,104 + \$1,032) / 2] / \$19,480 = 20.01$$

$$\text{Cash conversion cycle} = 38.98 + 30.15 - 20.01 = 49.12$$

$$d. (\$53,774 / \$59,707) = 0.90$$

Review 4-4—Solution (\$ millions)

a. \$ millions	July 25, 2015	July 26, 2014
Accounts receivable, net	\$ 5,344	\$ 5,157
Inventories	1,627	1,591
Financing receivables, net	4,491	4,153
Deferred tax assets	2,915	2,808
Other current assets	1,490	1,331
Property and equipment, net	3,332	3,252
Financing receivables, net	3,858	3,918
Goodwill	24,469	24,239
Purchased intangible assets, net	2,376	3,280
Other assets	3,163	3,267
Total operating assets	<u>\$53,065</u>	<u>\$52,996</u>
Accounts payable	\$ 1,104	\$ 1,032
Income taxes payable	62	159
Accrued compensation	3,049	3,181
Deferred revenue	9,824	9,478
Other current liabilities	5,687	5,451
Income taxes payable	1,876	1,851
Deferred revenue	5,359	4,664
Other long-term liabilities	1,459	1,748
Total operating liabilities	<u>\$28,420</u>	<u>\$27,564</u>

\$ millions	July 25, 2015	July 26, 2014
Total operating assets	\$53,065	\$52,996
Total operating liabilities	28,420	27,564
Net operating assets (NOA)	<u><u>\$24,645</u></u>	<u><u>\$25,432</u></u>

Review 4-5—Solution (\$ millions)

- a. NOPBT for fiscal 2015, labeled “Operating income” on the income statement, is \$10,770 million.
 b. The nonoperating activities at Cisco, labeled “Interest and other income, net” on the income statement totals \$(431) which represents nonoperating income (similar to Intel, Cisco has a large amount of investments, nonoperating assets that generate interest income in excess of the company’s interest expense).
 Interest and other income, net × Statutory tax rate = Tax shield.

$$(\text{431}) \times 37\% = \$159$$

$\begin{array}{r} \text{Provision for income taxes} \\ \text{Add back tax shield} \\ \text{Tax on operating profit} \end{array}$	$\begin{array}{r} \$2,220 \\ + (159) \\ \hline \$2,061 \end{array}$
$\begin{array}{r} \text{c. Net operating profit before tax (NOPBT)} \\ \text{Deduct tax on operating profit} \\ \text{Net operating profit after tax (NOPAT)} \end{array}$	$\begin{array}{r} \$10,770 \\ (2,061) \\ \hline \$8,709 \end{array}$

Review 4-6—Solution (\$ millions)

$$\text{RNOA} = \frac{\$8,709}{(\$24,645 + \$25,432)/2} = 34.78\%$$

Review 4-7—Solution (\$ millions)

$$\text{NOPM} = \frac{\$8,709}{\$49,161} = 17.72\%$$

$$\text{NOAT} = \frac{\$49,161}{(\$24,645 + \$25,432)/2} = 1.963$$

RNOA = Net Operating Profit Margin (NOPM) × Net Operating Asset Turnover (NOAT)

$$34.78\% = 17.72\% \times 1.963$$

Review 4-8—Solution (\$ millions)

a. ROE = Operating return (RNOA) + Nonoperating return

$$15.44\% = 34.78\% + \text{Nonoperating return}$$

$$\text{Nonoperating return} = 15.44\% - 34.78\%$$

$$\text{Nonoperating return} = (19.34)\%$$

b. Net nonoperating obligations = Nonoperating liabilities – Nonoperating assets

	July 25, 2015	July 26, 2014
Short-term debt.....	\$ 3,897	\$ 508
Long-term debt.....	<u>21,457</u>	<u>20,337</u>
Nonoperating liabilities.....	\$ 25,354	\$ 20,845
Cash and cash equivalents	\$ 6,877	\$ 6,726
Investments	<u>53,539</u>	<u>45,348</u>
Nonoperating assets	<u>\$ 60,416</u>	<u>\$ 52,074</u>
Net nonoperating obligations (NNO)	<u><u>\$(35,062)</u></u>	<u><u>\$(31,229)</u></u>

FLEV = Average NNO/Average Total Equity

$$\text{FLEV} = \frac{[$(35,062) + $(31,229)] / 2}{($59,707 + $56,661) / 2} = (0.5697)$$

Cisco's FLEV is negative because the company holds significant amounts of nonoperating assets that exceed the company's nonoperating liabilities. That is, NNO is negative which makes FLEV negative.

c.	Nonoperating expense (income)	<u>\$(431)</u>
	Tax shield at 37%.....	<u>159</u>
	Net nonoperating expense (NNE).....	<u><u>\$(272)</u></u>

$$\text{NNEP} = \frac{ $(272)}{[$(35,062) + $(31,229)] / 2} = 0.82\%$$

d. RNOA – NNEP = 34.78% – 0.82% = 33.96%

e. $15.44\% = [34.78\% + (-0.5697 \times 33.96\%)] \times 1.00014$



$$\text{NCIR} = \frac{\$8,981 / \$8,981}{\$58,176 / \$58,184} = 1.00014$$

Review 4-9—Solution (\$ millions)

a. Current ratio 2015: $\$76,283 / \$23,623 = 3.23$

Current ratio 2014: $\$67,114 / \$19,809 = 3.39$

Quick ratio 2015: $(\$6,877 + \$53,539 + \$5,344) / \$23,623 = 2.78$

Quick ratio 2014: $(\$6,726 + \$45,348 + \$5,157) / \$19,809 = 2.89$

b. Liabilities-to-equity ratio 2015: $\$53,774 / \$59,707 = 0.90$

Liabilities-to-equity ratio 2014: $\$48,409 / \$56,661 = 0.85$

Times interest earned ratio 2015: $\$10,770 / \$566 = 19.03$