ATTLEBORO GROUP, INC.
Comparative Balance Sheet
December 31, 2012 and 2011

	2012	2011	Increase (Decrease)
Current assets:			
Cash and cash equivalents	$ 11,800	$ 15,200	$ (3,400)
Accounts receivable	42,200	43,900	(1,700)
Inventories	96,800	93,500	3,300
Plant assets:			
Land	39,800	14,000	25,800
Equipment, net	101,100	93,800	7,300
Total assets	$ 291,700	$ 260,400	$ 31,300
Current liabilities:			
Accounts payable	$ 25,100	$ 26,300	$ (1,200)
Accrued liabilities	24,200	22,500	1,700
Long-term liabilities:			
Notes payable	51,000	64,000	(13,000)
Stockholders' equity:			
Common stock	136,600	128,300	8,300
Retained earnings	54,800	19,300	35,500
Total liabilities and stockholders' equity	$ 291,700	$ 260,400	$ 31,300

ATTLEBORO GROUP, INC.
Income Statement
Year Ended December 31, 2012

Revenues:		
Sales revenue		$ 441,000
Interest revenue		11,300
Total revenues		$ 452,300
Expenses:		
Cost of goods sold	$ 205,300	
Salary expense	76,500	
Depreciation expense	15,100	
Other operating expense	49,600	
Interest expense	24,700	
Income tax expense	16,700	
Total expenses		387,900
Net income		$ 64,400

Requirement

1. Prepare the spreadsheet for the 2012 statement of cash flows. Format cash flows from operating activities by the *indirect* method.

P14B-4B (3) Preparing the statement of cash flows—indirect method [45–60 min]

Review the data from P14-31B.

Requirement

1. Prepare the spreadsheet for All Wired's 2012 statement of cash flows. Format cash flows from operating activities by the *indirect* method.

15 Financial Statement Analysis

How can we use the financial statement results to analyze a company?

SMART TOUCH LEARNING, INC.
Balance Sheet
May 31, 2013

Assets				Liabilities	
Current assets:				Current liabilities:	
Cash		$ 4,800		Accounts payable	$ 48,700
Accounts receivable		2,600		Salary payable	900
Inventory		30,500		Interest payable	100
Supplies		600		Unearned service revenue	400
Prepaid rent		2,000		Total current liabilities	50,100
Total current assets			$ 40,500	Long-term liabilities:	
Plant assets:				Notes payable	20,000
Furniture	$18,000			Total liabilities	70,100
Less: Accumulated depreciation—furniture	300	17,700			
Building	48,000			**Stockholders' Equity**	
Less: Accumulated depreciation—building	200	47,800		Common stock	30,000
Total plant assets			65,500	Retained earnings	5,900
				Total stockholders' equity	35,900
Total assets			$106,000	Total liabilities and stockholders' equity	$106,000

Learning Objectives

1. Perform a horizontal analysis of financial statements
2. Perform a vertical analysis of financial statements
3. Prepare and use common-size financial statements
4. Compute and evaluate the standard financial ratios

Now that you have learned some of the "how-tos" of financial statement preparation, you may be asking, "How can I use financial statements in a meaningful way to help me manage my company better? How can I compare my company's results with companies that do what I do?"

In this chapter, you'll learn tools that allow users to see beyond the pure "numbers" on the financial statements and translate them into meaningful analysis. We'll start by analyzing the statements of Smart Touch Learning and finish the chapter by analyzing Greg's Tunes.

Investors and creditors cannot evaluate a company by examining only one year's data. This is why most financial statements cover at least two periods. In fact, most financial analysis covers trends of three to five years. This chapter shows you how to use some of the analytical tools for charting a company's progress through time. These tools can be

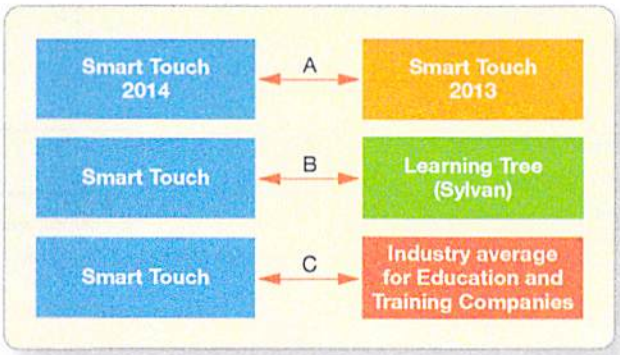
used by small business owners to measure performance, by financial analysts to analyze stock investments, by auditors to obtain an overall sense of a company's financial health, by creditors to determine credit risk, or by any other person wanting to compare financial data in relevant terms.

To accurately determine a company's performance, such as for Smart Touch, we need to compare its performance

A. from year to year.

B. with a competing company, like Learning Tree.

C. with the education and training industry as a whole.



Then we will have a better idea of how to judge Smart Touch's present situation and predict what might happen in the near future.

There are three main ways to analyze financial statements:

- Horizontal analysis provides a year-to-year comparison of a company's performance in different periods.
- Another technique, vertical analysis, is a way to compare different companies.
- Comparing to the industry average provides a comparison of a company's performance in relationship to the industry in which the company operates.

We'll start with horizontal analysis.

Horizontal Analysis

1 Perform a horizontal analysis of financial statements

Many decisions hinge on whether the numbers—sales, expenses, and net income—are increasing or decreasing. Have sales and other revenues risen from last year? By how much?

Sales may have increased by $1,723 million ($3,189 – $1,466 from Exhibit 15-1 on the next page), but considered alone, this fact is not very helpful. The *percentage change* in sales over time is more relative and, therefore, more helpful. It is better to know that sales increased by 117.5% than to know that sales increased by $1,723 million.

The study of percentage changes in comparative statements is called **horizontal analysis.** Horizontal analysis compares one year to the next. Computing a percentage change in comparative statements requires two steps:

1. Compute the dollar amount of the change from the earlier period to the later period.
2. Divide the dollar amount of change by the earlier period amount. We call the earlier period the base period.

EXHIBIT 15-1 Comparative Income Statement, Smart Touch Learning, Inc.

SMART TOUCH LEARNING, INC.*
Income Statement (Adapted)
Year Ended December 31, 2014 and 2013

(In millions)	2014	2013
Revenues (same as Net sales)	$3,189	$1,466
Expenses:		
Cost of revenues (same as Cost of goods sold)	1,458	626
Sales and marketing expense	246	120
General and administrative expense	140	57
Research and development expense	225	91
Other expense	470	225
Income before income tax	650	347
Income tax expense	251	241
Net income	$ 399	$ 106

*All values are assumed.

Illustration: Smart Touch Learning, Inc.

Horizontal analysis is illustrated for Smart Touch as follows (dollar amounts in millions):

			Increase (Decrease)	
	2014	2013	Amount	Percentage
Revenues (same as Net sales).....	$3,189	$1,466	$1,723	117.5%

Smart Touch sales increased by an incredible 117.5% during 2014, computed as follows:

STEP 1: Compute the dollar amount of change in sales from 2014 to 2013:

2014	2013	Increase
$3,189	– $1,466	= $1,723

STEP 2: Divide the dollar amount of change by the base-period amount. This computes the percentage change for the period:

$$\text{Percentage change} = \frac{\text{Dollar amount of change}}{\text{Base-period amount}}$$

$$= \frac{\$1,723}{\$1,466} = 1.175 = 117.5\%$$

Completed horizontal analyses for Smart Touch's financial statements are shown in the following exhibits:

- Exhibit 15-2 Income Statement
- Exhibit 15-3 Balance Sheet

EXHIBIT 15-2 | Comparative Income Statement—Horizontal Analysis

SMART TOUCH LEARNING, INC.*
Income Statement (Adapted)
Year Ended December 31, 2014 and 2013

(Dollar amounts in millions)	2014	2013	Increase (Decrease) Amount	Increase (Decrease) Percentage
Revenues	$3,189	$1,466	$1,723	117.5%
Cost of revenues	1,458	626	832	132.9
Gross profit	$1,731	$ 840	$ 891	106.1
Operating expenses:				
Sales and marketing expense	$ 246	$ 120	$ 126	105.0
General and administrative expense	140	57	83	145.6
Research and development expense	225	91	134	147.3
Other expense	470	225	245	108.9
Total operating expenses	$1,081	$ 493	$ 588	119.3
Income before income tax	$ 650	$ 347	$ 303	87.3
Income tax expense	251	241	10	4.1
Net income	$ 399	$ 106	$ 293	276.4

*All values are assumed.

EXHIBIT 15-3 | Comparative Balance Sheet—Horizontal Analysis

SMART TOUCH LEARNING, INC.*
Balance Sheet (Adapted)
December 31, 2014 and 2013

(Dollar amounts in millions)	2014	2013	Increase (Decrease) Amount	Increase (Decrease) Percentage
Assets				
Current assets:				
Cash and cash equivalents	$ 427	$149	$ 278	186.6%
Other current assets	2,266	411	1,855	451.3
Total current assets	$2,693	$560	$ 2,133	380.9
Property, plant, and equipment, net	379	188	191	101.6
Intangible assets, net	194	106	88	83.0
Other assets	47	17	30	176.5
Total assets	$3,313	$871	$ 2,442	280.4
Liabilities				
Current liabilities:				
Accounts payable	$ 33	$ 46	$ (13)	(28.3)%
Other current liabilities	307	189	118	62.4
Total current liabilities	$ 340	$235	$ 105	44.7
Long-term liabilities	44	47	(3)	(6.4)
Total liabilities	$ 384	$282	$ 102	36.2
Stockholders' Equity				
Common stock	$ 1	$ 45	$ (44)	(97.8)
Retained earnings and other equity	2,928	544	2,384	438.2
Total stockholders' equity	$2,929	$589	$ 2,340	397.3
Total liabilities and stockholders' equity	$3,313	$871	$ 2,442	280.4

*All values are assumed.

Horizontal Analysis of the Income Statement

Smart Touch's comparative income statement reveals exceptional growth during 2014. An increase of 100% occurs when an item doubles, so Smart Touch's 117.5% increase in revenues means that revenues more than doubled.

The item on Smart Touch's income statement with the slowest growth rate is income tax expense. Income taxes increased by only 4.1%. On the bottom line, net income grew by an incredible 276.4%. That is real progress!

Horizontal Analysis of the Balance Sheet

Smart Touch's comparative balance sheet also shows rapid growth in assets, with total assets increasing by 280.4%. That means total assets almost quadrupled in one year. Very few companies grow that fast.

Smart Touch's liabilities grew more slowly. Total liabilities increased by 36.2%, and Accounts payable and long-term liabilities actually decreased, as indicated by the liability figures in parentheses. This is another indicator of positive growth for Smart Touch.

Trend Analysis

Trend analysis is a form of horizontal analysis. Trend precentages indicate the direction a business is taking. How have sales changed over a five-year period? What trend does net income show? These questions can be answered by trend analysis over a period, such as three to five years.

Trend analysis percentages are computed by selecting a base year (the earliest year). The base year amounts are set equal to 100%. The amounts for each subsequent year are expressed as a percentage of the base amount. To compute trend analysis percentages, we divide each item for the following years by the base year amount.

$$\text{Trend \%} = \frac{\text{Any year \$}}{\text{Base year \$}} \times 100$$

Assume Smart Touch's total revenues were $1,000 million in 2010 and rose to $3,189 million in 2014. To illustrate trend analysis, review the trend of net sales during 2010–2014, with dollars in millions. The base year is 2010, so that year's percentage is set equal to 100.

(In millions)	2014	2013	2012	2011	2010
Net sales.....	$3,189	1,466	1,280	976	1,000
Trend percentages	318.9%	146.6%	128%	97.6%	100%

We want percentages for the five-year period 2010–2014. We compute these by dividing each year's amount by the 2010 net sales amount. Net sales decreased slightly in 2011 and then the rate of growth increased from 2012–2014.

You can perform a trend analysis on any one or multiple item(s) you consider important. Trend analysis is widely used to predict the future health of a company.

Key Takeaway

Horizontal analysis allows a company to see the percentage change from one year to the next. Trend analysis can show the percentage change from a base year forward to determine whether the trend in net sales, for example, is positive or negative.

Vertical Analysis

2 Perform a vertical analysis of financial statements

As we have seen, horizontal analysis and trend analysis percentages highlight changes in an item from year to year, or over *time*. But no single technique gives a complete picture of a business, so we also need vertical analysis.

Vertical analysis of a financial statement shows the relationship of each item to its base amount, which is the 100% figure. Every other item on the statement is then reported as a percentage of that base. For the income statement, net sales is the base.

$$\text{Vertical analysis \%} = \frac{\text{Each income statement item}}{\text{Revenues (net sales)}} \times 100$$

Exhibit 15-4 shows the completed vertical analysis of Smart Touch's 2014 and 2013 comparative income statement.

The vertical analysis percentage for Smart Touch's cost of revenues is 45.7% of net sales ($1,458/$3,189 = 0.457 or 45.7%) in 2014 and 42.7% ($626/$1,466 = 0.427 or 42.7%) in 2013. This means that for every $1 in net sales, almost $0.46 in 2014 and almost $0.43 in 2013 is spent on cost of revenue.

On the bottom line, Smart Touch's net income is 12.5% of revenues in 2014 and 7.2% of revenues in 2013. That improvement from 2013 to 2014 is extremely good. Suppose under normal conditions a company's net income is 10% of revenues. A drop to 4% may cause the investors to be alarmed and sell their stock.

EXHIBIT 15-4 | Comparative Income Statement—Vertical Analysis

SMART TOUCH LEARNING, INC.*
Comparative Income Statement (Adapted)
Years Ended December 31, 2014 and 2013

	2014		2013	
(Dollar amounts in millions)	Amount	Percent of Total	Amount	Percent of Total
Revenues	$3,189	100.0%	$1,466	100.0%
Cost of revenues	1,458	45.7	626	42.7
Gross profit	$1,731	54.3	$ 840	57.3
Operating expenses:				
Sales and marketing expense	$ 246	7.7	$ 120	8.2
General and administrative expense	140	4.4	57	3.9
Research and development expense	225	7.1	91	6.2
Other expense	470	14.7	225	15.3
Total operating expenses	$1,081	33.9	$ 493	33.6
Income before income tax	$ 650	20.4	$ 347	23.7
Income tax expense	251	7.9	241	16.5^
Net income	$ 399	12.5%	$ 106	7.2%

*All values are assumed. ^The calculated percentage of 16.4 was adjusted for rounding to 16.5.

Exhibit 15-5 on the following page depicts the vertical analysis of Smart Touch's balance sheet. The base amount (100%) is total assets. The base amount is also total liabilities and equity, because they are exactly the same number, in 2014 that's $3,313. (Recall that they should always be the same number because of the accounting equation.)

EXHIBIT 15-5 | Comparative Balance Sheet—Vertical Analysis

SMART TOUCH LEARNING, INC.*
Balance Sheet (Adapted)
December 31, 2014 and 2013

	2014		2013	
(Dollar amount in millions)	Amount	Percent of Total	Amount	Percent of Total
Assets				
Current Assets:				
Cash and cash equivalents	$ 427	12.9%	$149	17.1%
Other current assets	2,266	68.4	411	47.2
Total current assets	$2,693	81.3	$560	64.3
Property, plant, and equipment, net	379	11.4	188	21.6
Intangible assets, net	194	5.9	106	12.1^
Other assets	47	1.4	17	2.0
Total assets	$3,313	100.0%	$871	100.0%
Liabilities				
Current Liabilities:				
Accounts payable	$ 33	1.0%	$ 46	5.3%
Other current liabilities	307	9.3	189	21.7
Total current liabilities	$ 340	10.3	$235	27.0
Long-term liabilities	44	1.3	47	5.4
Total liabilities	$ 384	11.6	$282	32.4
Stockholders' Equity				
Common stock	$ 1	0.0	$ 45	5.2
Retained earnings and other equity	2,928	88.4	544	62.4
Total stockholders' equity	$2,929	88.4	$589	67.6
Total liabilities and stockholders' equity	$3,313	100.0%	$871	100.0%

*All values are assumed. ^percents rounded to balance.

The vertical analysis of Smart Touch's balance sheet reveals several interesting things:

- Current assets make up 81.3% of total assets in 2014 and 64.3% of total assets in 2013. For most companies this percentage is closer to 30%. The 81.3% of current assets represents a great deal of liquidity and a significant increase in liquidity from 2013 to 2014.
- Property, plant, and equipment make up only 11.4% of total assets in 2014 but 21.6% of total assets in 2013. This percentage is low because of the nature of Smart Touch's business. Smart Touch's Web-based operations do not require many buildings or equipment.
- Total liabilities are only 11.6% of total assets in 2014, but were 32.4% of total assets in 2013. This improvement is positive for Smart Touch. Stockholders' equity makes up 88.4% of total assets in 2014 and 67.6% of total assets in 2013. Most of Smart Touch's equity is retained earnings and other equity—signs of a strong company because most of the equity is internally generated rather than externally generated (through stock share sales).

Key Takeaway

Vertical analysis shows the relationship of each item on the statement to a base amount. The base amount is net sales on the income statement and total assets on the balance sheet. All other items are reported as a percentage of the 100% net sales line on the income statement or the 100% total assets line on the balance sheet.

How Do We Compare One Company with Another?

3 Prepare and use common-size financial statements

Horizontal analysis and vertical analysis provide much useful data about a company. As we have seen, Smart Touch's percentages depict a very successful company. But the data apply only to one business.

To compare Smart Touch to another company we can use a common-size statement. A **common-size statement** reports only percentages—the same percentages that appear in a vertical analysis. By only reporting percentages, it removes dollar value bias when comparing one company to another company. **Dollar value bias** is the bias one sees from comparing numbers in absolute (dollars) rather than relative (percentage) terms. For us, $1 million seems like a large number. For some large companies, it is immaterial. Smart Touch's common-size income statement is an example of removing dollar value bias. This statement comes directly from the percentages in Exhibit 15-4.

We could prepare common size statements for Smart Touch from year to year; however, we will start by preparing common size income statements for Smart Touch and **Learning Tree**, both of which compete in the service-learning industry. Which company earns a higher percentage of revenues as profits for its shareholders? Exhibit 15-6 gives both companies' common-size income statements for 2014 so that we may compare them on a relative, not absolute, basis.

EXHIBIT 15-6 **Common-Size Income Statement Smart Touch vs. Learning Tree**

SMART TOUCH vs. LEARNING TREE*
Common-Size Income Statement
Year Ended December 31, 2014

	Smart Touch	Learning Tree
Revenues	100.0%	100.0%
Cost of revenues	45.7	36.3
Gross profit	54.3	63.7
Sales and marketing expense	7.7	21.8
General and administrative expense	4.4	7.3
Research and development expense	7.1	10.3
Other expense (income)	14.7	(11.5)
Income before income tax	20.4	35.8
Income tax expense	7.9	12.3
Net income	12.5%	23.5%

*All values are assumed.

Exhibit 15-6 shows that **Learning Tree** was more profitable than Smart Touch in 2014. **Learning Tree**'s gross profit percentage is 63.7%, compared to Smart Touch's 54.3%. This means that **Learning Tree** is earning more profit from every dollar of revenue than Smart Touch is earning. And, most importantly, **Learning Tree**'s percentage of net income to revenues is 23.5%. That means almost one-fourth of **Learning Tree**'s revenues result in profits for the company's stockholders. Smart Touch's percentage of net income to revenues, on the other hand, is 12.5%. Both are excellent percentages; however, the common-size statement highlights **Learning Tree**'s advantages over Smart Touch.

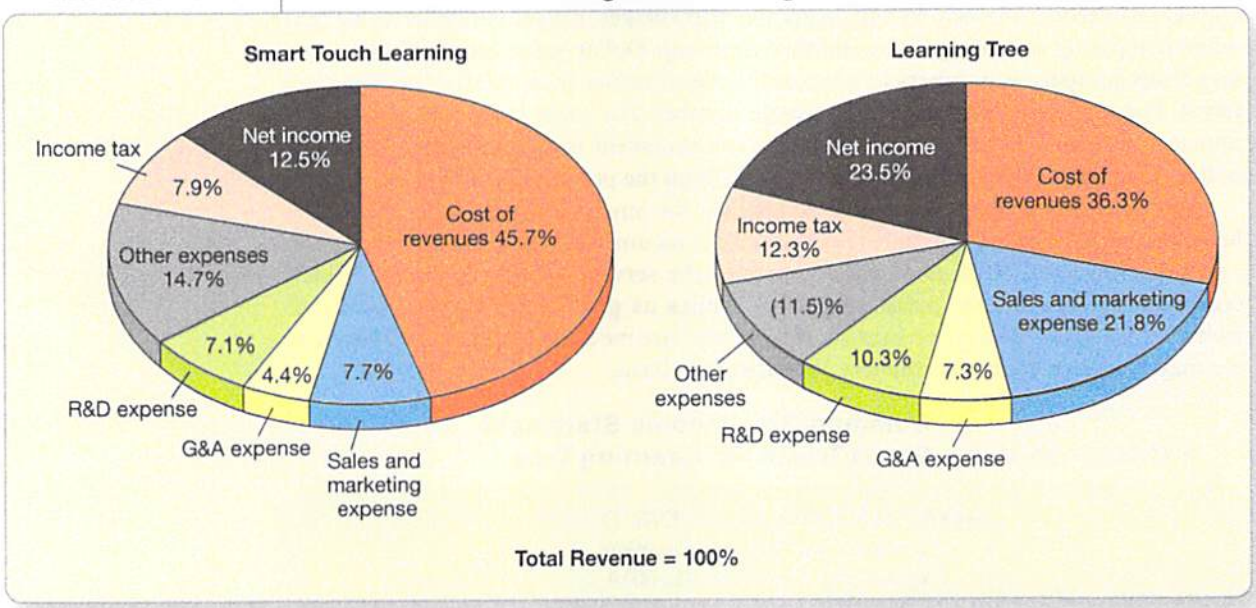
Benchmarking

Benchmarking is the practice of comparing a company with other leading companies. It often uses the common size percentages in a graphical manner to highlight differences. There are two main types of benchmarks in financial statement analysis: benchmarking against a key competitor and benchmarking against the industry average.

Benchmarking Against a Key Competitor

Exhibit 15-6 uses a key competitor, **Learning Tree**, to compare Smart Touch's profitability. The two companies compete in the same industry, so **Learning Tree** serves as an ideal benchmark for Smart Touch. The graphs in Exhibit 15-7

EXHIBIT 15-7 **Graphical Analysis of Common-Size Income Statement**
Smart Touch Learning vs. Learning Tree



highlight the profitability difference between the companies. Focus on the segment of the graphs showing net income. Learning Tree is clearly more profitable than Smart Touch.

Benchmarking Against the Industry Average

The industry average can also serve as a very useful benchmark for evaluating a company. An industry comparison would show how Smart Touch is performing alongside the average for the e-learning industry. *Annual Statement Studies*, published by the Risk Management Association, provides common-size statements for most industries. To compare Smart Touch to the industry average, we would simply insert the industry-average common-size income statement in place of Learning Tree in Exhibit 15-6.

Stop & Think...

As you are taking classes toward your degree, how do you know how quickly you can complete your studies? If you knew the average credit hours taken each semester was 12 credit hours, the 12 hours would be your benchmark. Comparing the number of classes you take to the average of 12 hours a semester is the same concept as benchmarking. Maybe you are taking 15 hours a semester. Then you'd be completing your degree faster than the average student. Maybe you take only 3 credit hours in the Spring so you can work a part-time job. Then, you'd be completing classes at a slower pace than average.

Key Takeaway

Vertical analysis can be used to prepare common-size statements to compare companies against each other. We can benchmark (measure) a company against a key competitor or measure a company against the industry average.

Now let's put your learning to practice. Work the summary problem on the following page, which reviews the concepts from the first half of this chapter.

Summary Problem 15-1

Requirements

Perform a horizontal analysis and a vertical analysis of the comparative income statement of Kimball Corporation, which makes iPod covers. State whether 2014 was a good year or a bad year, and give your reasons.

KIMBALL CORPORATION
Comparative Income Statement
Years Ended December 31, 2014 and 2013

	2014	2013
Net sales	$300,000	$250,000
Expenses:		
Cost of goods sold	$214,200	$170,000
Engineering, selling, and administrative expenses	54,000	48,000
Interest expense	6,000	5,000
Income tax expense	9,000	3,000
Other expense (income)	2,700	(1,000)
Total expenses	285,900	225,000
Net income	$ 14,100	$ 25,000

Solution

KIMBALL CORPORATION
Horizontal Analysis of Comparative Income Statement
Years Ended December 31, 2014 and 2013

	2014	2013	Increase (Decrease) Amount	Increase (Decrease) Percent
Net sales	$300,000	$250,000	$ 50,000	20.0%
Expenses:				
Cost of goods sold	$214,200	$170,000	$ 44,200	26.0
Engineering, selling, and administrative expenses	54,000	48,000	6,000	12.5
Interest expense	6,000	5,000	1,000	20.0
Income tax expense	9,000	3,000	6,000	200.0
Other expense (income)	2,700	(1,000)	3,700	—*
Total expenses	285,900	225,000	60,900	27.1
Net income	$ 14,100	$ 25,000	$ (10,900)	(43.6%)

*Percentage changes are typically not computed for shifts from a negative to a positive amount, and vice versa.

The horizontal analysis shows that net sales increased 20.0%. Total expenses increased by 27.1%, and net income decreased 43.6%. So, even though Kimball's net sales increased, the company's expenses increased by a larger percentage, netting an overall 43.6% reduction in net income between the years. This analysis identifies areas where management should review more data. For example, Cost of goods sold increased 26.0%. Managers would want to know why this increase occurred to determine if the company can implement cost saving strategies (such as purchasing from other, lower cost vendors).

KIMBALL CORPORATION
Vertical Analysis of Comparative Income Statement
Years Ended December 31, 2014 and 2013

	2014		2013	
	Amount	Percent	Amount	Percent
Net sales	$300,000	100.0%	$250,000	100.0%
Expenses:				
Cost of goods sold	$214,200	71.4	$170,000	68.0
Engineering, selling, and administrative expenses	54,000	18.0	48,000	19.2
Interest expense	6,000	2.0	5,000	2.0
Income tax expense	9,000	3.0	3,000	1.2
Other expense (income)	2,700	0.9	(1,000)	(0.4)
Total expenses	285,900	95.3	225,000	90.0
Net income	$ 14,100	4.7%	$ 25,000	10.0%

The vertical analysis shows changes in the percentages of net sales. A few notable items are

- cost of goods sold—increased from 68.0% to 71.4%;
- engineering, selling, and administrative expenses—decreased from 19.2% to 18.0%.

These two items are Kimball's largest dollar expenses, so their percentage changes are important. This indicates that cost controls need to be improved, especially for COGS.

The 2014 net income declined to 4.7% of sales, compared with 10.0% the preceding year. Kimball's increase in cost of goods sold is the biggest factor in the overall decrease in net income as a percentage of sales. The horizontal analysis showed that although Net sales increased 20% from 2013 to 2014, the amount of each of those sales dollars resulting in net income decreased.

Using Ratios to Make Decisions

4 Compute and evaluate the standard financial ratios

Online financial databases, such as **Lexis/Nexis** and the **Dow Jones News Retrieval Service**, provide data on thousands of companies. Suppose you want to compare some companies' recent earnings histories. You might want to compare companies' returns on stockholders' equity. The computer could then search the databases and give you the names of the 20 companies with the highest return on equity. You can use any ratio to search for information that is relevant to a particular decision.

Remember, however, that no single ratio tells the whole picture of any company's performance. Different ratios explain different aspects of a company. The ratios we discuss in this chapter may be classified as follows:

1. Evaluating the ability to pay current liabilities
2. Evaluating the ability to sell inventory and collect receivables
3. Evaluating the ability to pay long-term debt
4. Evaluating profitability
5. Evaluating stock as an investment

Evaluating the Ability to Pay Current Liabilities

Working capital is defined as follows:

Working capital = Current assets – Current liabilities

Working capital measures the ability to meet short-term obligations with current assets. Two decision tools based on working-capital data are the *current ratio* and the *acid-test ratio*.

Current Ratio

The most widely used ratio is the *current ratio*, which is current assets divided by current liabilities. The current ratio measures a company's ability to pay current liabilities with its current assets.

Exhibit 15-8 on the following page shows the comparative income statement and balance sheet of Greg's Tunes, which we will be using in the remainder of this chapter.

The current ratios of Greg's Tunes, at December 31, 2014 and 2013, follow, along with the average for the entertainment industry:

Formula	Greg's Tunes' Current Ratio 2014	Greg's Tunes' Current Ratio 2013	Industry Average
Current ratio = $\frac{\text{Current assets}}{\text{Current liabilities}}$	$\frac{\$262{,}000}{\$142{,}000} = 1.85$	$\frac{\$236{,}000}{\$126{,}000} = 1.87$	0.60

A high current ratio indicates that the business has sufficient current assets to maintain normal business operations. Compare Greg's Tunes' current ratio of 1.85 for 2014 with the industry average of 0.60.

What is an acceptable current ratio? The answer depends on the industry. The norm for companies in most industries is around 1.50, as reported by the Risk Management Association. Greg's Tunes' current ratio of 1.85 is strong. Keep in mind that we would not want to see a current ratio that is too high, say 25.0. This would indicate that the company is too liquid and, therefore, is not using its assets effectively. For example, the company may need to reduce inventory levels so as not to tie up available resources.

EXHIBIT 15-8 | Comparative Financial Statements

GREG'S TUNES, INC.
Comparative Income Statement
Years Ended December 31, 2014 and 2013

	2014	2013
Net sales	$858,000	$803,000
Cost of goods sold	513,000	509,000
Gross profit	$345,000	$294,000
Operating expenses:		
Selling expenses	$126,000	$114,000
General expenses	118,000	123,000
Total operating expenses	$244,000	$237,000
Income from operations	$101,000	$ 57,000
Interest revenue	4,000	—
Interest (expense)	(24,000)	(14,000)
Income before income taxes	$ 81,000	$ 43,000
Income tax expense	33,000	17,000
Net income	$ 48,000	$ 26,000

GREG'S TUNES, INC.
Comparative Balance Sheet
December 31, 2014 and 2013

	2014	2013
Assets		
Current assets:		
Cash	$ 29,000	$ 32,000
Accounts receivable, net	114,000	85,000
Inventories	113,000	111,000
Prepaid expenses	6,000	8,000
Total current assets	$262,000	$236,000
Long-term investments	18,000	9,000
Property, plant, and equipment, net	507,000	399,000
Total assets	$787,000	$644,000
Liabilities		
Current liabilities:		
Accounts payable	$ 73,000	$ 68,000
Accrued liabilities	27,000	31,000
Notes payable	42,000	27,000
Total current liabilities	$142,000	$126,000
Long-term notes payable	289,000	198,000
Total liabilities	$431,000	$324,000
Stockholders' Equity		
Common stock, no par	$186,000	$186,000
Retained earnings	170,000	134,000
Total stockholders' equity	$356,000	$320,000
Total liabilities and stockholders' equity	$787,000	$644,000

Acid-Test Ratio

The *acid-test* (or *quick*) *ratio* tells us whether the entity could pay all its current liabilities if they came due immediately. That is, could the company pass the *acid test*?

To compute the acid-test ratio, we add cash, short-term investments (those that may be sold in the lesser of 12 months or the business operating cycle), and net current receivables (accounts and notes receivable, net of allowances) and divide this sum by current liabilities. Inventory and prepaid expenses are *not* included in the acid test because they are the least-liquid current assets. Greg's Tunes' acid-test ratios for 2014 and 2013 follow:

	Formula	Greg's Tunes' Acid-Test Ratio 2014		Greg's Tunes' Acid-Test Ratio 2013		Industry Average
Acid-test ratio	$= \frac{\text{Cash + Short-term investments + Net current receivables}}{\text{Current liabilities}}$	$\frac{\$29{,}000 + \$0 + \$114{,}000}{\$142{,}000}$	$= 1.01$	$\frac{\$32{,}000 + \$0 + \$85{,}000}{\$126{,}000}$	$= 0.93$	0.46

The company's acid-test ratio improved during 2014 and is significantly better than the industry average. The norm for the acid-test ratio ranges from 0.20 for shoe retailers to 1.00 for manufacturers of equipment, as reported by the Risk Management Association. An acid-test ratio of 0.90 to 1.00 is acceptable in most industries.

Evaluating the Ability to Sell Inventory and Collect Receivables

In this section, we discuss five ratios that measure the company's ability to sell inventory and collect receivables.

Inventory Turnover

The inventory turnover ratio measures the number of times a company sells its average level of inventory during a year. A high rate of turnover indicates ease in selling inventory; a low rate indicates difficulty. A value of 4 means that the company sold its average level of inventory four times—once every three months—during the year. If the company were a seasonal company, this would be a good ratio because it would mean it turned its inventory over each season, on average.

To compute inventory turnover, we divide cost of goods sold by the average inventory for the period. We use the cost of goods sold—not sales—because both cost of goods sold and inventory are stated *at cost*. Sales at *retail* are not comparable with inventory at *cost*.

Greg's Tunes' inventory turnover for 2014 is as follows:

Formula		Greg's Tunes' Inventory Turnover		Industry Average
Inventory turnover	$= \frac{\text{Cost of goods sold}}{\text{Average inventory}}$	$\frac{\$513{,}000}{\$112{,}000}$	$= 4.6$	27.7

Cost of goods sold comes from the income statement (Exhibit 15-8). Average inventory is figured by adding the beginning inventory of $111,000 to the ending inventory of $113,000 and dividing by 2. (See the balance sheet, Exhibit 15-8.)

Inventory turnover varies widely with the nature of the business. For example, most manufacturers of farm machinery have an inventory turnover close to three times a year. In contrast, companies that remove natural gas from the ground hold their inventory for a very short period of time and have an average turnover of 30. Greg's Tunes' turnover of 4.6 times a year means on average the company has

enough inventory to handle sales for over 79 days (365/4.6 times). This is very low for its industry, which has an average turnover of 27.7 times per year. This ratio has identified an area that Greg's Tunes needs to improve.

Days in Inventory

Another key measure is the number of days in inventory ratio. This measures the average number of days inventory is held by the company. Greg's Tunes' days in inventory for 2014 is as follows:

Formula	Greg's Tunes' Days in Inventory	Industry Average
Days in inventory = $\frac{365 \text{ days}}{\text{Inventory turnover ratio}}$	$\frac{365 \text{ days}}{4.6}$ = 79 days	13 days

Days in inventory varies widely, depending on the business. Greg's Tunes' days in inventory is 79 days—too high for its industry, which has a days in inventory ratio of only 13 days. This ratio has identified an area that Greg's Tunes needs to improve. Greg's Tunes should focus on reducing average inventory held. By decreasing average inventory, the company can increase inventory turnover and lower the average days in inventory. Greg's will also be able to reduce its inventory storage and insurance costs, as well as reduce the risk of holding obsolete inventory.

Gross Profit Percentage

Gross profit (gross margin) is net sales minus the cost of goods sold. Merchandisers strive to increase the *gross profit percentage* (also called the *gross margin percentage*). This measures the profitability of each net sales dollar.

Greg's Tunes' gross profit percentage for 2014 is as follows:

Formula	Greg's Tunes' Gross Profit Percentage	Industry Average
Gross profit percentage = $\frac{\text{Gross profit}}{\text{Net sales}}$	$\frac{\$345{,}000}{\$858{,}000}$ = 0.402 or 40.2%	43%

Gross profit percentage varies widely, depending on the business. Greg's Tunes' gross profit percentage is 40.2%, which is slightly lower than the industry, which has a gross profit percentage of 43%. This ratio has identified an area that Greg's Tunes needs to improve. To increase gross profit percentage, Greg's Tunes needs to decrease the cost of the merchandise and/or increase revenue (selling price). Additionally, addressing Greg's inventory turnover issues will probably help Greg's to increase its gross profit percentage.

Accounts Receivable Turnover

The accounts receivable turnover ratio measures the ability to collect cash from credit customers. The higher the ratio, the faster the cash collections. But a receivable turnover that is too high may indicate that credit is too tight, causing the loss of sales to good customers.

To compute accounts receivable turnover, we divide net credit sales (assuming all Greg's sales from Exhibit 15-8 are on account) by average net accounts receivable.

Greg's Tunes' accounts receivable turnover ratio for 2014 is computed as follows:

Formula	Greg's Tunes' Accounts Receivable Turnover	Industry Average
Accounts receivable turnover = $\frac{\text{Net credit sales}}{\text{Average net accounts receivable}}$	$\frac{\$858{,}000}{\$99{,}500} = 8.6$	29.1

Net credit sales comes from the income statement (Exhibit 15-8). Average net accounts receivable is figured by adding the beginning Accounts receivable of $85,000 to the ending Accounts receivable of $114,000 and dividing by 2. (See the balance sheet, Exhibit 15-8.)

Greg's receivable turnover of 8.6 times per year is much slower than the industry average of 29.1. Why the difference? Greg's is a fairly new business that sells to established people who pay their accounts over time. Further, this turnover coincides with the lower than average inventory turnover. So, Greg's may achieve a higher receivable turnover by increasing its inventory turnover ratio.

Days' Sales in Receivables

The *days' sales in receivables* ratio also measures the ability to collect receivables. Days' sales in receivables tell us how many days' sales remain in Accounts receivable.

To compute this ratio for Greg's Tunes for 2014, we divide 365 days by the accounts receivable turnover ratio we previously calculated:

Formula	Greg's Tunes' Days' Sales in Accounts Receivable	Industry Average
Days' sales in average accounts receivable = $\frac{365 \text{ days}}{\text{Accounts receivable turnover ratio}}$	$\frac{365}{8.6} = 42$ days	25 days

Greg's Tunes' ratio tells us that 42 average days' sales remain in Accounts receivable and need to be collected. The company's days' sales in receivables ratio is much higher (worse) than the industry average of 25 days. Greg's might give its customers a longer time to pay, such as 45 days versus 30 days. Alternatively, Greg's credit department may need to review the criteria it uses to evaluate individual customer's credit. Without the customers' good paying habits, the company's cash flow would suffer.

Evaluating the Ability to Pay Long-Term Debt

The ratios discussed so far yield insight into current assets and current liabilities. They help us measure ability to sell inventory, collect receivables, and pay current liabilities. Most businesses also have long-term debt. Three key indicators of a business's ability to pay long-term liabilities are the *debt ratio*, the *debt to equity ratio*, and the *times-interest-earned ratio*.

Debt Ratio

A loan officer at Metro Bank is evaluating loan applications from two companies. Both companies have asked to borrow $500,000 and have agreed to repay the loan over a five-year period. The first firm already owes $600,000 to another bank. The second company owes only $100,000. If all else is equal, the bank is more likely to lend money to Company 2 because that company owes less than Company 1.

The relationship between total liabilities and total assets—called the *debt ratio*—shows the proportion of assets financed with debt. If the debt ratio is 1, then all the assets are financed with debt. A debt ratio of 50% means that half the assets are financed with debt and the other half are financed by the owners of the business. The higher the debt ratio, the higher the company's financial risk.

The debt ratios for Greg's Tunes at the end of 2014 and 2013 follow:

Formula	Greg's Tunes' Debt Ratio 2014	Greg's Tunes' Debt Ratio 2013	Industry Average
Debt ratio = Total liabilities / Total assets	$431,000 / $787,000 = 0.548 (54.8%)	$324,000 / $644,000 = 0.503 (50.3%)	0.69 (69%)

Both total liabilities and total asset amounts are from the balance sheet, presented in Exhibit 15-8. Greg's debt ratio in 2014 of 54.8% is not very high. The Risk Management Association reports that the average debt ratio for most companies ranges from 57% to 67%, with relatively little variation from company to company. Greg's debt ratio indicates a fairly low-risk position compared with the industry average debt ratio of 69%.

Debt to Equity Ratio

The relationship between total liabilities and total equity—called the **debt to equity ratio**—shows the proportion of total liabilities relative to the proportion of total equity that is financing the company's assets. Thus, this ratio measures financial leverage. If the debt to equity ratio is greater than 1, then the company is financing more assets with debt than with equity. If the ratio is less than 1, then the company is financing more assets with equity than with debt. The higher the debt to equity ratio, the higher the company's financial risk.

The debt to equity ratios for Greg's Tunes at the end of 2014 and 2013 follow:

Formula	Greg's Tunes' Debt to Equity Ratio 2014	Greg's Tunes' Debt to Equity Ratio 2013	Industry Average
Debt to equity = Total liabilities / Total equity	$431,000 / $356,000 = 1.21	$324,000 / $320,000 = 1.01	2.23

Greg's debt to equity ratio in 2014 of 1.21 is not very high. Greg's debt to equity ratio indicates a fairly low-risk position compared with the industry average debt to equity ratio of 2.23.

Times-Interest-Earned Ratio

The debt ratio and debt to equity ratio say nothing about the ability to pay interest expense. Analysts use the **times-interest-earned ratio** to relate Earnings before interest and taxes (EBIT) to interest expense. This ratio is also called the **interest-coverage ratio.** It measures the number of times EBIT can cover (pay) interest expense. A high interest-coverage ratio indicates ease in paying interest expense; a low ratio suggests difficulty.

To compute this ratio, we divide EBIT (Net income + Income tax expense + Interest expense) by interest expense. Calculation of Greg's times-interest-earned ratio follows:

Formula	Greg's Tunes' Times-Interest-Earned Ratio 2014	Greg's Tunes' Times-Interest-Earned Ratio 2013	Industry Average
Times-interest-earned ratio = EBIT / Interest expense	($48,000 + $33,000 + $24,000) / $24,000 = 4.38	($26,000 + $17,000 + $14,000) / $14,000 = 4.07	7.80

The company's times-interest-earned ratios 4.38 for 2014 and 4.07 for 2013 are significantly lower than the average for the industry of 7.80 times but is slightly better than the average U.S. business. The norm for U.S. business, as reported by the Risk Management Association, falls in the range of 2.0 to 3.0. When you consider Greg's debt ratio and its times-interest-earned ratio, Greg's Tunes appears to have little difficulty *servicing its debt*, that is, paying liabilities.

Connect To: Ethics

Ratios are carefully watched by lenders, investors, and analysts. Recall that we classify assets and liabilities as current if they will be used/settled within one year or the operating cycle, whichever is longer. The classification between current and long-term is clear, and, as you have seen, it affects many ratios. A company on the border of exceeding debt ratio levels stated in its loan agreements must carefully watch these classifications, as well as the timing of decisions it makes, in order to legally protect its status with the lender.

Evaluating Profitability

The fundamental goal of business is to earn a profit. Ratios that measure profitability often are reported in the business press. Let's examine five profitability measures.

Rate of Return on Net Sales

In business, the term *return* is used broadly as a measure of profitability. Consider a ratio called the **rate of return on net sales**, or simply **return on sales**. (The word *net* is usually omitted for convenience, even though net sales is used to compute the ratio.) The rate of return on net sales ratio shows the percentage of each net sales dollar earned as net income. Greg's Tunes' rate of return on sales follows:

Formula	Greg's Tunes' Rate of Return on Net Sales 2014	Greg's Tunes' Rate of Return on Net Sales 2013	Industry Average
Rate of return on net sales = Net income / Net sales	$48,000 / $858,000 = 0.056 (5.6%)	$26,000 / $803,000 = 0.032 (3.2%)	0.017 (1.7%)

Both net income and net sales amounts are from the income statement presented in Exhibit 15-8. Companies strive for a high rate of return on net sales. The higher the rate of return, the more sales dollars end up as profit. The increase in Greg's rate of return on net sales from 2013 to 2014 is significant and identifies the company as more successful than the average CD sales and music service provider, whose rate of return on net sales is 1.7%.

Rate of Return on Total Assets

The *rate of return on total assets*, or simply *return on assets*, measures a company's success in using assets to earn a profit. Two groups finance a company's assets:

- Creditors have loaned money to the company, and they earn interest.
- Shareholders have invested in stock, and their return is net income.

The sum of interest expense and net income divided by average total assets is the return to the two groups that have financed the company's assets. Computation of the rate of return on total assets ratio for Greg's Tunes follows:

Formula	Greg's Tunes' 2014 Rate of Return on Total Assets	Industry Average
Rate of return on total assets = (Net income + Interest expense) / Average total assets	($48,000 + $24,000) / $715,500 = 0.101 (10.1%)	0.060 (6.0%)

Net income and interest expense come from the income statement (Exhibit 15-8). Average total assets is figured by adding the beginning Total assets of $644,000 to the ending Total assets of $787,000 and dividing by 2. (See the balance sheet, Exhibit 15-8.) Greg's Tunes' rate of return on total assets ratio of 10.1% is much better than the industry average of 6.0%.

Asset Turnover Ratio

The **asset turnover ratio** measures the amount of net sales generated for each average dollar of total assets invested. This ratio measures how well a company is using its assets to generate sales revenues. To compute this ratio, we divide net sales by average total assets. Greg's Tunes' 2014 asset turnover ratio is as follows:

Formula	Greg's Tunes' 2014 Asset Turnover Ratio	Industry Average
Asset turnover ratio = $\frac{\text{Net sales}}{\text{Average total assets}}$	$\frac{\$858{,}000}{\$715{,}500}$ = 1.20 times	3.52 times

Greg's asset turnover ratio of 1.20 is much lower than the industry average of 3.52 times. Recall that Greg's gross profit percentage was lower than the industry's also. Normally, companies with high gross profit percentages will have low asset turnover. Companies with low gross profit percentages will have high asset turnover ratios. This is another area where Greg's management must consider options to increase sales and decrease its average total assets to improve this ratio.

Rate of Return on Common Stockholders' Equity

A popular measure of profitability is *rate of return on common stockholders' equity*, often shortened to *return on equity*. This ratio shows the relationship between net income and common stockholders' equity. The rate of return on common stockholders' equity shows how much income is earned for each $1 invested by the common shareholders.

To compute this ratio, we first subtract preferred dividends from net income to get net income available to the common stockholders. (Greg's does not have any preferred stocks issued, so preferred dividends are zero.) Then we divide net income available to common stockholders by average common stockholders' equity during the year. Common equity is total stockholders' equity minus preferred equity. Average common stockholders' equity is the average of the beginning and ending common stockholders' equity balances [($356,000 + $320,000)/2 or $338,000].

The 2014 rate of return on common stockholders' equity for Greg's Tunes follows:

Formula	Greg's Tunes' 2014 Rate of Return on Common Stockholders' Equity	Industry Average
Rate of return on common stockholders' equity = $\frac{\text{Net income} - \text{Preferred dividends}}{\text{Average common stockholders' equity}}$	$\frac{\$48{,}000 - \$0}{\$338{,}000}$ = 0.142 (14.2%)	0.105 (10.5%)

Greg's rate of return on common stockholders' equity of 14.2% is higher than its rate of return on total assets of 10.1%. This difference results from borrowing at one rate—say, 8%—and investing the money to earn a higher rate, such as the firm's 14.2% return on equity. This practice is called **trading on the equity**, or using *leverage*. It is directly related to the debt ratio. The higher the debt ratio, the higher the leverage. Companies that finance operations with debt are said to *leverage* their positions.

During good times, leverage increases profitability. But, leverage can have a negative impact on profitability as well. Therefore, leverage is a double-edged sword,

increasing profits during good times but compounding losses during bad times. Compare Greg's Tunes' rate of return on common stockholders' equity with the industry average of 10.5%. Once again, Greg's Tunes is performing much better than the average company in its industry. A rate of return on common stockholders' equity of 15%–20% year after year is considered good in most industries. At 14.2%, Greg's is doing well.

Earnings per Share of Common Stock

Earnings per share of common stock, or simply *earnings per share (EPS)*, is perhaps the most widely quoted of all financial statistics. EPS is the only ratio that must appear on the face of the income statement. EPS is the amount of net income earned for each share of the company's outstanding *common* stock. Recall that

Outstanding stock = Issued stock – Treasury stock

Earnings per share is computed by dividing net income available to common stockholders by the number of common shares outstanding during the year. Preferred dividends are subtracted from net income because the preferred stockholders have the first claim to dividends. Greg's Tunes has no preferred stock outstanding and, therefore, paid no preferred dividends.

The firm's EPS for 2014 and 2013 follow. (Note that Greg's had 10,000 shares of common stock outstanding throughout both years.)

Formula		Greg's Tunes' Earnings per Share		Industry Average
		2014	2013	
Earnings per share of common stock	$= \frac{\text{Net income} - \text{Preferred dividends}}{\text{Number of shares of common stock outstanding}}$	$\frac{\$48{,}000 - \$0}{10{,}000} = \$4.80$	$\frac{\$26{,}000 - \$0}{10{,}000} = \$2.60$	$9.76

Greg's Tunes' EPS increased significantly in 2014 (by almost 85%). Its stockholders should not expect this big a boost in EPS every year. Most companies strive to increase EPS by 10%–15% annually, and leading companies do so. But even the most successful companies have an occasional bad year. EPS for the industry at $9.76 is a little over twice Greg's Tunes' 2014 EPS. Therefore, Greg's Tunes needs to work on continuing to increase EPS so that it is more competitive with other companies in its industry.

Evaluating Stock Investments

Investors purchase stock to earn a return on their investment. This return consists of two parts: (1) gains (or losses) from selling the stock at a price above (or below) purchase price and (2) dividends. The ratios we examine in this section help analysts evaluate stock investments.

Price/Earnings Ratio

The **price/earnings ratio** is the ratio of the market price of a share of common stock to the company's earnings per share. The price/earnings ratio shows the market price of $1 of earnings. This ratio, abbreviated P/E, appears in the *Wall Street Journal* stock listings.

Calculations for the P/E ratios of Greg's Tunes follow. The market price of its common stock was $60 at the end of 2014 and $35 at the end of 2013. These prices for real companies can be obtained from a financial publication, a stockbroker, or the company's Web site.

Formula	Greg's Tunes' Price/Earnings Ratio 2014	Greg's Tunes' Price/Earnings Ratio 2013	Industry Average
$\text{P/E ratio} = \frac{\text{Market price per share of common stock}}{\text{Earnings per share}}$	$\frac{\$60.00}{\$4.80} = 12.50$	$\frac{\$35.00}{\$2.60} = 13.46$	17.79

The market price for Greg's common stock was stated in the previous paragraph. The earnings per share values were calculated immediately before the P/E ratio. Greg's P/E ratio for 2014 of 12.50 means that the company's stock is selling at 12.5 times one year's earnings. Net income is more controllable, and net income increased during 2014. Greg's would like to see this ratio increase in future years in order to be more in line with the industry average P/E of 17.79.

Dividend Yield

Dividend yield is the ratio of annual dividends per share to the stock's market price per share. This ratio measures the percentage of a stock's market value that is returned annually as dividends to shareholders. *Preferred* stockholders, who invest primarily to receive dividends, pay special attention to dividend yield.

Greg's paid annual cash dividends of $1.20 per share of common stock in 2014 and $1.00 in 2013. As noted previously, market prices of the company's common stock were $60 in 2014 and $35 in 2013. The firm's dividend yields on common stock follow:

Formula	Dividend Yield on Greg's Tunes' Common Stock 2014	Dividend Yield on Greg's Tunes' Common Stock 2013	Industry Average
$\text{Dividend yield on common stock}^* = \frac{\text{Annual dividends per share of common stock}}{\text{Market price per share of common stock}}$	$\frac{\$1.20}{\$60.00} = 0.020\ (2\%)$	$\frac{\$1.00}{\$35.00} = 0.029\ (2.9\%)$	0.036 (3.6%)

*Dividend yields may also be calculated for preferred stock.

Both the annual dividends and the market price for this calculation were given in the previous paragraph. An investor who buys Greg's Tunes' common stock for $60 can expect to receive 2% of the investment annually in the form of cash dividends. The industry, however, is paying out 3.6% annually. An investor might be willing to accept lower dividends (cash now) if the stock's market price is growing (cash later when the stock is sold).

Dividend Payout

Dividend payout is the ratio of annual dividends declared per common share relative to the earnings per share of the company. This ratio measures the percentage of earnings paid annually to common shareholders as cash dividends. Recall that Greg's paid annual cash dividends of $1.20 per share of common stock in 2014 and $1.00 in 2013. Earnings per share were calculated on the previous page as $4.80 per share for 2014 and $2.60 for 2013. So, Greg's dividend payout yields are as follows:

		Greg's Tunes' Dividend Payout on Common Stock		
	Formula	2014	2013	Industry Average
Dividend Payout	$= \frac{\text{Annual dividends per share}}{\text{Earnings per share}}$	$\frac{\$1.20}{\$4.80} = 0.25$ or 25%	$\frac{\$1.00}{\$2.60} = 0.38$ or 38%	0.63 or 63%

Greg's Tunes' dividend payout ratio of 25% in 2014 and 38% in 2013 is less than the industry average of 63%. Greg's, being a fairly new company, might be retaining more of its earnings for growth and expansion. An investor who buys Greg's Tunes' common stock may predict annual cash dividends to be about 25% of earnings, based on the 2014 dividend payout ratio. This investor would want to see higher market prices and higher asset turnover for Greg's Tunes' in the future for Greg's to stay competitive.

Book Value per Share of Common Stock

Book value per share of common stock is common equity divided by the number of common shares outstanding. Common equity equals total stockholders' equity less preferred equity. Greg's has no preferred stock outstanding. Its book value per share of common stock ratios follow. (Note that 10,000 shares of common stock were outstanding.)

		Greg's Tunes' Book Value per Share of Common Stock	
	Formula	2014	2013
Book value per share of common stock	$= \frac{\text{Total stockholders' equity} - \text{Preferred equity}}{\text{Number of shares of common stock outstanding}}$	$\frac{\$356{,}000 - \$0}{10{,}000} = \$35.60$	$\frac{\$320{,}000 - \$0}{10{,}000} = \$32.00$

The industry averages are not presented for book value per share of common stock as many experts argue that book value is not useful for investment analysis. It bears no relationship to market value and provides little information beyond stockholders' equity reported on the balance sheet. But some investors base their investment decisions on book value. For example, some investors rank stocks on the basis of the ratio of market price to book value. To these investors, the lower the ratio, the more attractive the stock.

Red Flags in Financial Statement Analyses

Analysts look for *red flags* in financial statements that may signal financial trouble. Recent accounting scandals highlight the importance of these red flags. The following conditions may reveal that the company is too risky.

- **Movement of Sales, Inventory, and Receivables.** Sales, inventory, and receivables generally move together. Increased sales lead to higher receivables and may require more inventory (or higher inventory turnover) to meet demand. Unexpected or inconsistent movements among sales, inventory, and receivables make the financial statements look suspect.
- **Earnings Problems.** Has net income decreased significantly for several years in a row? Did the company report net income in previous years but now is reporting net loss? Most companies cannot survive consecutive losses year after year.
- **Decreased Cash Flow.** Cash flow validates net income. Is cash flow from operations consistently lower than net income? If so, the company is in trouble. Are the sales of plant assets a major source of cash? If so, the company may face a cash shortage.
- **Too Much Debt.** How does the company's debt ratio compare to that of major competitors? If the debt ratio is too high, the company may be unable to pay its debts.
- **Inability to Collect Receivables.** Are days' sales in receivables growing faster than for competitors? If so, a cash shortage may be looming.
- **Buildup of Inventories.** Is inventory turnover too slow? If so, the company may be unable to sell goods, or it may be overstating inventory.

Do any of these red flags apply to either Smart Touch or Greg's Tunes from the analyses we did in the chapter? No, the financial statements of both companies depict strong and growing companies. Will both Smart Touch and Greg's Tunes continue to grow? Time will tell.

The Decision Guidelines on the following page summarize the most widely used ratios.

Key Takeaway

Ratio analysis is used to analyze financial statement data for many reasons. Ratios provide information about a company's performance and are best used to measure a company against other firms in the same industry and to denote trends within the company. Ratios tell users about a company's liquidity, solvency, profitability, and asset management. No one ratio can provide the whole picture a decision maker needs.

Decision Guidelines 15-1

USING RATIOS IN FINANCIAL STATEMENT ANALYSIS

Mike and Roberta Robinson want to begin investing for retirement. Their 401(k) retirement plan allows them to choose from six different investments. How will they determine which investments to choose? They use the standard ratios discussed in this chapter.

Ratio	Computation	Information Provided
Evaluating the ability to pay current liabilities:		
1. Current ratio	$\frac{\text{Current assets}}{\text{Current liabilities}}$	Measures ability to pay current liabilities with current assets
2. Acid-test (quick) ratio	$\frac{\text{Cash} + \text{Short-term investments} + \text{Net current receivables}}{\text{Current liabilities}}$	Shows ability to pay all current liabilities if they came due immediately
Evaluating the ability to sell inventory and collect receivables:		
3. Inventory turnover	$\frac{\text{Cost of goods sold}}{\text{Average inventory}}$	Indicates salability of inventory—the number of times a company sells its average level of inventory during a year
4. Days in inventory	$\frac{365 \text{ days}}{\text{Inventory turnover ratio}}$	Measures the average number of days inventory is held by the company
5. Gross profit percentage	$\frac{\text{Gross profit}}{\text{Net sales}}$	Measures the profitability of each sales dollar above cost of goods sold
6. Accounts receivable turnover	$\frac{\text{Net credit sales}}{\text{Average net accounts receivable}}$	Measures ability to collect cash from customers
7. Days' sales in receivables	$\frac{365}{\text{Accounts receivable turnover ratio}}$	Shows how many days' sales remain in Accounts receivable—how many days it takes to collect the average level of receivables
Evaluating the ability to pay long-term debt:		
8. Debt ratio	$\frac{\text{Total liabilities}}{\text{Total assets}}$	Indicates percentage of assets financed with debt
9. Debt to equity ratio	$\frac{\text{Total liabilities}}{\text{Total equity}}$	Indicates ratio of debt financing relative to equity financing

Ratio	Computation	Information Provided
10. Times-interest-earned ratio	$\frac{\text{EBIT}}{\text{Interest expense}}$	Measures the number of times EBIT can cover (pay) interest expense
Evaluating profitability:		
11. Rate of return on net sales	$\frac{\text{Net income}}{\text{Net sales}}$	Shows the percentage of each net sales dollar earned as net income
12. Rate of return on total assets	$\frac{\text{Net income + Interest expense}}{\text{Average total assets}}$	Measures how profitably a company uses its assets
13. Asset turnover ratio	$\frac{\text{Net sales}}{\text{Average total assets}}$	Measures the amount of net sales generated for each average dollar of total assets invested
14. Rate of return on common stockholders' equity	$\frac{\text{Net income – Preferred dividends}}{\text{Average common stockholders' equity}}$	Gauges how much income is earned for each dollar invested by the common shareholders
15. Earnings per share of common stock	$\frac{\text{Net income – Preferred dividends}}{\text{Number of shares of common stock outstanding}}$	Gives the amount of net income earned for each share of the company's outstanding common stock
Evaluating stock investments:		
16. Price/earnings ratio	$\frac{\text{Market price per share of common stock}}{\text{Earnings per share}}$	Indicates the market price of $1 of earnings
17. Dividend yield	$\frac{\text{Annual dividends per share of common (or preferred) stock}}{\text{Market price per share of common (or preferred) stock}}$	Measures the percentage of a stock's market value that is returned annually as dividends to stockholders
18. Dividend payout	$\frac{\text{Annual dividends per share}}{\text{Earnings per share}}$	Measures the percentage of earnings paid to the common shareholders as cash dividends.
19. Book value per share of common stock	$\frac{\text{Total stockholders' equity – Preferred equity}}{\text{Number of shares of common stock outstanding}}$	Indicates the recorded net equity amount from the balance sheet for each share of common stock outstanding

Summary Problem 15-2

JAVA, INC.
Four-Year Selected Financial Data (adapted)
Years Ended January 31, 2013–2010

Operating Results*	2013	2012	2011	2010
Net sales	$13,848	$13,673	$11,635	$ 9,054
Cost of goods sold	9,704	8,599	6,775	5,318
Interest expense	109	75	45	46
Income from operations	338	1,455	1,817	1,333
Income tax expense	100	263	338	247
Net income (net loss)	(8)	877	1,127	824
Cash dividends	76	75	76	77
Financial Position				
Merchandise inventory	1,677	1,904	1,462	1,056
Total assets	7,591	7,012	5,189	3,963
Current ratio	1.48:1	0.95:1	1.25:1	1.20:1
Stockholders' equity	3,010	2,928	2,630	1,574
Average number of shares of common stock outstanding (in thousands)	860	879	895	576

*Dollar amounts are in thousands.

Requirement

Using the financial data presented above, compute the following ratios and evaluate Java's results for 2011–2013:

1. Rate of return on net sales
2. Earnings per share
3. Inventory turnover
4. Times-interest-earned ratio
5. Rate of return on common stockholders' equity
6. Gross profit percentage

Solution

	2013	2012	2011
1. Rate of return on net sales	$\frac{\$(8)}{\$13,848} = (0.06\%)$	$\frac{\$877}{\$13,673} = 6.4\%$	$\frac{\$1,127}{\$11,635} = 9.7\%$
2. Earnings per share	$\frac{\$(8)}{860} = \$(0.01)$	$\frac{\$877}{879} = \$1.00$	$\frac{\$1,127}{895} = \$1.26$
3. Inventory turnover	$\frac{\$9,704}{(\$1,904 + \$1,677)/2} = 5.4$ times	$\frac{\$8,599}{(\$1,462 + \$1,904)/2} = 5.1$ times	$\frac{\$6,775}{(\$1,056 + \$1,462)/2} = 5.4$ times
4. Times-interest-earned ratio	$\frac{[\$(8) + \$100 + \$109]}{\$109} = 1.8$ times	$\frac{(\$75 + \$263 + \$75)}{\$75} = 5.5$ times	$\frac{(\$76 + \$338 + \$45)}{\$45} = 10.2$ times
5. Rate of return on common stockholders' equity	$\frac{\$(8)}{(\$2,929 + \$3,010)/2} = (0.3\%)$	$\frac{\$877}{(\$2,630 + \$2,928)/2} = 31.6\%$	$\frac{\$1,127}{(\$1,574 + \$2,630)/2} = 53.6\%$
6. Gross profit percentage	$\frac{(\$13,848 - \$9,704)}{\$13,848} = 29.9\%$	$\frac{(\$13,673 - \$8,599)}{\$13,673} = 37.1\%$	$\frac{(\$11,635 - \$6,775)}{\$11,635} = 41.8\%$

Evaluation: During this period, Java's operating results deteriorated on all these measures except inventory turnover. The times-interest-earned ratio and rate of return on common stockholders' equity percentages are down sharply. From these data, it is clear that Java could sell its coffee, but not at the markups the company enjoyed in the past. The final result, in 2013, was a net loss for the year.