CHAPTER 9

Responsibility Accounting

LEARNING OBJECTIVES

After you have mastered the material in this chapter you will be able to:

1 Describe the concept of decentralization.
2 Describe the differences among cost, profit, and investment centers.
3 Prepare and use responsibility reports.
4 Relate management by exception to responsibility reports.
5 Evaluate investment opportunities using return on investment.
6 Identify factors that affect return on investment.
7 Evaluate investment opportunities using residual income.
8 Describe how transfer prices may be established (Appendix).

CHAPTER OPENING

Walter Keller, a production manager, complained to the accountant, Kelly Oberson, that the budget system failed to control his department's labor cost. Ms. Oberson responded, "people, not budgets, control costs." Budgeting is one of many tools management uses to control business operations. Managers are responsible for using control tools effectively. **Responsibility accounting** focuses on evaluating the performance of individual managers. For example, expenses controlled by a production department manager are presented in one report and expenses controlled by a marketing department manager are presented in a different report. This chapter discusses the development and use of a responsibility accounting system.

The Curious Accountant

Warren Buffett, often identified as one of the richest men in the world, is the CEO of **Berkshire Hathaway, Inc.** (Berkshire). His company is actually a conglomerate that has major stockholdings in several large companies, including **American Express**, **Anheuser-Bush**, and **The Washington Post**. Additionally, Berkshire wholly owns over 70 other businesses ranging in size and diversity from the insurance giant **GEICO**, to **Fruit of the Loom**, to **See's Candies**. In all, Berkshire has 222,000 employees. How can one person, who is turning 81 in 2011, manage such a large and diverse business? (Answer on page 404.)

DECENTRALIZATION CONCEPT

LO 1

Describe the concept of decentralization.

Effective responsibility accounting requires clear lines of authority and responsibility. Divisions of authority and responsibility normally occur as a natural consequence of managing business operations. In a small business, one person can control everything: marketing, production, management, accounting. In contrast, large companies are so complex that authority and control must be divided among many people.

Consider the hiring of employees. A small business usually operates in a limited geographic area. The owner works directly with employees. She knows the job requirements, local wage rates, and the available labor pool. She is in a position to make informed hiring decisions. In contrast, a major corporation may employ thousands of employees throughout the world. The employees may speak different languages and have different social customs. Their jobs may require many different skills and pay a vast array of wage rates. The president of the corporation cannot make informed hiring decisions for the entire company. Instead, he delegates *authority* to a professional personnel manager and holds that manager *responsible* for hiring practices.

Decision-making authority is similarly delegated to individuals responsible for managing specific organization functions such as production, marketing, and accounting. Delegating authority and responsibility is referred to as **decentralization.** Decentralization offers advantages like the following.

1. *Encourages upper-level management to concentrate on strategic decisions.* Because local management makes routine decisions, upper-level management can concentrate on long-term planning, goal setting, and performance evaluation.
2. *Improves the quality of decisions by delegating authority down a chain of command.* Local managers are better informed about local concerns. Furthermore, their proximity to local events allows them to react quickly to changes in local conditions. As a result, local managers can generally make better decisions.
3. *Motivates managers to improve productivity.* The freedom to act coupled with responsibility for the results creates an environment that encourages most individuals to perform at high levels.
4. *Trains lower-level managers for increased responsibilities.* Decision making is a skill. Managers accustomed to making decisions about local issues are generally able to apply their decision-making skills to broader issues when they are promoted to upper management positions.
5. *Improves performance evaluation.* When lines of authority and responsibility are clear, credit or blame can be more accurately assigned.

Organization Chart

Exhibit 9.1 displays a partial organization chart for Panther Holding Company, a decentralized business. The chart shows five levels of authority and responsibility arranged in a hierarchical order from the top down. Other companies may have more or less complex organizational charts, depending on their decentralization needs and philosophy.

RESPONSIBILITY CENTERS

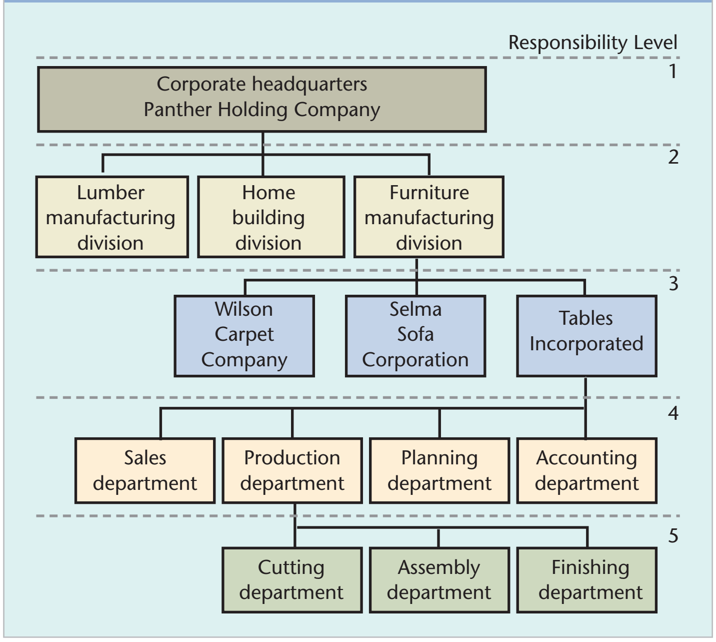
LO 2

Describe the differences among cost, profit, and investment centers.

Decentralized businesses are usually subdivided into distinct reporting units called responsibility centers. A **responsibility center** is an organizational unit that controls identifiable revenue or expense items. The unit may be a division, a department, a subdepartment, or even a single machine. For example, a transportation company may identify a semitrailer truck as a responsibility center. The company holds the truck driver responsible for the revenues and expenses associated with operating the

EXHIBIT 9.1

Organization Chart



truck. Responsibility centers may be divided into three categories: cost, profit, and investment.

A **cost center** is an organizational unit that incurs expenses but does not generate revenue. In the Panther organization chart (Exhibit 9.1), the finishing department and the production department are cost centers. Cost centers normally fall on the lower levels of an organization chart. The manager of a cost center is judged on his ability to keep costs within budget parameters.

A **profit center** differs from a cost center in that it not only incurs costs but also generates revenue. In the Panther organization chart, the companies at the third level (Wilson Carpet Company, Selma Sofa Corporation, and Tables Incorporated) are considered profit centers. The manager of a profit center is judged on his ability to produce revenue in excess of expenses.

Investment center managers are responsible for revenues, expenses, and the investment of capital. Investment centers normally appear at the upper levels of an organization chart. The second-level division managers (managers of the lumber, home, and furniture divisions) in the Panther organization are responsible for investment centers. Managers of investment centers are accountable for assets and liabilities as well as earnings.

RESPONSIBILITY REPORTS

A **responsibility report** is prepared for each manager who controls a responsibility center. The report compares the expectations for the manager's responsibility center with the center's actual performance. A typical report lists the items under the manager's control, both the budgeted amount and the actual amount spent for each item, and the differences between budgeted and actual amounts (variances).

LO 3

Prepare and use responsibility reports.

EXHIBIT 9.2

Responsibility Reports

PANTHER HOLDING COMPANY
Second Level: Furniture Manufacturing Division
For the Month Ended January 31, 2011

	Budget	Actual	Variance
Controllable expenses			
Administrative division expense	$ 20,400	$ 31,100	$(10,700) U
Company president's salary	9,600	9,200	400 F
Wilson Carpet Company	82,100	78,400	3,700 F
Selma Sofa Corporation	87,200	116,700	(29,500) U
Tables Incorporated	48,600	51,250	(2,650) U
Total	$247,900	$286,650	$(38,750) U

PANTHER HOLDING COMPANY
Third Level: Tables Incorporated
For the Month Ended January 31, 2011

	Budget	Actual	Variance
Controllable expenses			
Administrative division expense	$ 3,000	$ 2,800	$ 200 F
Department managers' salaries	10,000	11,200	(1,200) U
Sales department costs	9,100	8,600	500 F
Production department costs	13,500	13,750	(250) U
Planning department costs	4,800	7,000	(2,200) U
Accounting department costs	8,200	7,900	300 F
Total	$ 48,600	$ 51,250	$ (2,650) U

PANTHER HOLDING COMPANY
Fourth Level: Production Department
For the Month Ended January 31, 2011

	Budget	Actual	Variance
Controllable expenses			
Administrative staff expense	$ 900	$ 1,100	$ (200) U
Supervisory salaries	2,800	2,800	0
Cutting department costs	1,400	1,200	200 F
Assembly department costs	2,800	2,900	(100) U
Finishing department costs	5,600	5,750	(150) U
Total	$ 13,500	$ 13,750	$ (250) U

PANTHER HOLDING COMPANY
Fifth Level: Finishing Department
For the Month Ended January 31, 2011

	Budget	Actual	Variance
Controllable expenses			
Wages expense	$ 3,200	$ 3,000	$ 200 F
Direct materials	1,100	1,400	(300) U
Supplies	400	500	(100) U
Small tools	600	650	(50) U
Other expenses	300	200	100 F
Total	$ 5,600	$ 5,750	$ (150) U

MANAGEMENT BY EXCEPTION

LO 4

Relate management by exception to responsibility reports.

Responsibility reports are arranged to support using the **management by exception** doctrine. Exhibit 9.2 illustrates a partial set of responsibility reports for Panther Holding Company. From the lower level upward, each successive report includes summary data from the preceding report. For example, the detailed information about the finishing department (a level five responsibility center) is summarized as a single line item ($150 unfavorable variance) in the report for the production department (a level four responsibility center).

The lack of detailed information may appear to hinder the production manager's ability to control costs. In fact, it has the opposite effect. The supervisor of the finishing department should use her responsibility report to identify and correct problems without bothering the production manager. The production manager should become concerned only when one of his supervisors loses control. The summary data in the production manager's report will adequately advise him of such situations. With this format, managers will concentrate only on significant deviations from expectations (management by exception) because the deviations are highlighted in their responsibility reports.

Applying the management by exception doctrine to the variances in her responsibility report, the division manager of the Furniture Manufacturing Division (second level responsibility center) should concentrate her efforts on two areas. First, the $29,500 unfavorable variance for Selma Sofa Corporation indicates Selma's expenditures are out of line. Second, the $10,700 unfavorable variance for the division manager's own administrative expenses indicates those costs are significantly above budget expectations. The division manager should request detailed reports for these two areas. Other responsibility centers seem to be operating within reason and can be left to their respective managers. This reporting format focuses management's attention on the areas where it is most needed.

The complete responsibility accounting report would also include the first responsibility level, corporate headquarters. At the corporate level, responsibility reports normally include year-to-date income statements to inform management of the company's overall performance. To facilitate decision making, these income statements are normally prepared using the contribution margin format. Exhibit 9.3 shows the January 2011 income statement for Panther Holding Company.

EXHIBIT 9.3

Panther Income Statement (Contribution Margin Format)

PANTHER HOLDING COMPANY
Income Statement for Internal Use
For the Month Ended January 31, 2011

	Budget	Actual	Variance
Sales	$984,300	$962,300	$22,000 U
Variable expenses			
Variable product costs	343,100	352,250	9,150 U
Variable selling expenses	105,000	98,000	7,000 F
Other variable expenses	42,200	51,100	8,900 U
Total variable expenses	490,300	501,350	11,050 U
Contribution margin	494,000	460,950	33,050 U
Fixed expenses			
Fixed product cost	54,100	62,050	7,950 U
Fixed selling expense	148,000	146,100	1,900 F
Other fixed expenses	23,000	25,250	2,250 U
Total fixed expenses	225,100	233,400	8,300 U
Net income	$268,900	$227,550	$41,350 U

Answers to The Curious Accountant

Mr. Buffett oversees the diverse operations of **Berkshire** by using a very decentralized management structure. According to its 2009 annual report, Berkshire had 222,000 employees and earned $112 billion in revenue. Mr. Buffett managed this empire from his headquarters in Omaha, Nebraska, that consists of 21 employees and occupies only 9,708 square feet, although the company's vice-chairman, Charles Munger, who works out of Los Angeles, occupies another 655 square feet. The total payroll, including benefits, of both locations was only $3,531,978 in 2006, and that amount is *not* in thousands. Mr. Buffett's own description about his and Mr. Munger's management style is, ". . . we delegate almost to the point of abdication." An exaggeration perhaps, but clearly a decentralized style.

Source: Company's annual reports.

Controllability Concept

The **controllability concept** is crucial to an effective responsibility accounting system. Managers should only be evaluated based on revenues or costs they control. Holding individuals responsible for things they cannot control is demotivating. Isolating control, however, may be difficult, as illustrated in the following case.

Dorothy Pasewark, a buyer for a large department store chain, was criticized when stores could not resell the merchandise she bought at the expected price. Ms. Pasewark countered that the sales staff caused the sluggish sales by not displaying the merchandise properly. The sales staff charged that the merchandise had too little sales potential to justify setting up more enticing displays. The division of influence between the buyer and the sales staff clouds the assignment of responsibility.

Since the exercise of control may be clouded, managers are usually held responsible for items over which they have *predominant* rather than *absolute* control. At times responsibility accounting may be imperfect. Management must strive to ensure that praise or criticism is administered as fairly as possible.

Qualitative Reporting Features

Responsibility reports should be expressed in simple terms. If they are too complex, managers will ignore them. The reports should include only the budgeted and actual amounts of *controllable* revenues and expenses, with variances highlighted to promote management by exception. Report preparers and report users should communicate regularly to ensure the reports provide relevant information. Furthermore, reports must be timely. A report that presents yesterday's problem is not nearly as useful as one that presents today's problem.

Managerial Performance Measurement

A primary reason for a responsibility accounting system is to evaluate managerial performance. Managers are assigned responsibility for certain cost, profit, or investment centers. They are then evaluated based on how their centers perform relative to specific goals and objectives. The measurement techniques (standard costs and contribution margin format income reporting) used for cost and profit centers have been discussed in previous chapters. The remainder of this chapter discusses performance measures for investment centers.

RETURN ON INVESTMENT

LO 5

Evaluate investment opportunities using return on investment.

Society confers wealth, prestige, and power upon those who have control of assets. Unsurprisingly, managers are motivated to increase the amount of assets employed by the investment centers they control. When companies have additional assets available to invest, how do upper-level managers decide which centers should get them? The additional assets are frequently allotted to the managers who demonstrate the greatest potential for increasing the company's wealth. DuPont pioneered an often-copied approach to assess managerial potential by comparing the return on investment ratios of various investment centers. The **return on investment (ROI)** is the ratio of wealth generated (operating income) to the amount invested (operating assets) to generate the wealth. ROI is commonly expressed with the following equation.

$$\text{ROI} = \frac{\text{Operating income}}{\text{Operating assets}}$$

To illustrate using ROI for comparative evaluations, assume Panther Holding Company's corporate (first level) chief financial officer (CFO) determined the ROIs for the company's three divisions (second level investment centers). The CFO used the following accounting data from the records of each division:

	Lumber Manufacturing Division	Home Building Division	Furniture Manufacturing Division
Operating income	$ 60,000	$ 46,080	$ 81,940
Operating assets	300,000	256,000	482,000

The ROI for each division is:

$$\text{Lumber manufacturing: } \frac{\text{Operating income}}{\text{Operating assets}} = \$60{,}000 \div \$300{,}000 = 20\%$$

$$\text{Home building: } \frac{\text{Operating income}}{\text{Operating assets}} = \$46{,}080 \div \$256{,}000 = 18\%$$

$$\text{Furniture manufacturing: } \frac{\text{Operating income}}{\text{Operating assets}} = \$81{,}940 \div \$482{,}000 = 17\%$$

All other things being equal, higher ROIs indicate better performance. In this case the Lumber Manufacturing Division manager is the best performer. Assume Panther obtains additional funding for expanding the company's operations. Which investment center is most likely to receive the additional funds?

If the manager of the Lumber Manufacturing Division convinces the upper-level management team that his division would continue to outperform the other two divisions, the Lumber Manufacturing Division would most likely get the additional funding. The manager of the lumber division would then invest the funds in additional operating assets, which would in turn increase the division's operating income. As the division prospers, Panther would reward the manager for exceptional performance. Rewarding the manager of the lumber division would likely motivate the other managers to improve their divisional ROIs. Internal competition would improve the performance of the company as a whole.

Qualitative Considerations

Why do companies compute ROI using operating income and operating assets instead of using net income and total assets? Suppose Panther's corporate headquarters closes a furniture manufacturing plant because an economic downturn temporarily reduces the demand for furniture. It would be inappropriate to include these nonoperating plant assets in the denominator of the ROI computation. Similarly, if Panther sells the

CHECK YOURSELF 9.1

Green View is a lawn services company whose operations are divided into two districts. The District 1 manager controls $12,600,000 of operating assets. District 1 produced $1,512,000 of operating income during the year. The District 2 manager controls $14,200,000 of operating assets. District 2 reported $1,988,000 of operating income for the same period. Use return on investment to determine which manager is performing better.

Answer

District 1

ROI = Operating income ÷ Operating assets = $1,512,000 ÷ $12,600,000 = 12%

District 2

ROI = Operating income ÷ Operating assets = $1,988,000 ÷ $14,200,000 = 14%

Because the higher ROI indicates the better performance, the District 2 manager is the superior performer. This conclusion is based solely on quantitative results. In real-world practice, companies also consider qualitative factors.

furniture plant and realizes a large gain on the sale, including the gain in the numerator of the ROI formula would distort the result. Since the manager of the Furniture Manufacturing Division does not control closing the plant or selling it, it is unreasonable to include the effects of these decisions in computing the ROI. These items would, however, be included in computing net income and total assets. Most companies use operating income and operating assets to compute ROI because those variables measure performance more accurately.

Measuring Operating Assets

The meaning of ROI results is further complicated by the question of how to *value* operating assets. Suppose Echoles Rental Company's two divisions, Northern and Southern, each rent to customers a vending machine that originally cost $5,000. The vending machines have five-year useful lives and no salvage value. The Northern Division purchased its machine one year ago; the Southern Division purchased its machine three years ago. At the end of the current year, the book values of the two machines are as follows:

	Northern Division's Vending Machine	Southern Division's Vending Machine
Original cost	$5,000	$5,000
Less accumulated depreciation	(1,000)	(3,000)
Book value	$4,000	$2,000

Each machine generates operating income averaging $800 per year. The ROI for each machine this year is as follows:

$$\textbf{Northern Division: } \frac{\text{Operating income}}{\text{Operating assets}} = \$800 \div \$4{,}000 = 20\%$$

$$\textbf{Southern Division: } \frac{\text{Operating income}}{\text{Operating assets}} = \$800 \div \$2{,}000 = 40\%$$

Is the manager of the Southern Division outperforming the manager of the Northern Division? No. The only difference between the two divisions is that Southern is using an older asset than Northern. Using book value as the valuation base can distort the ROI and cause severe motivational problems. Managers will consider comparisons between different investment centers unfair because the ROIs do not accurately reflect performance. Furthermore, managers may avoid replacing obsolete equipment because purchasing new equipment would increase the dollar amount of operating assets, reducing the ROI.

Companies may minimize these problems by using original cost instead of book value in the denominator of the ROI formula. In the vending machine example, using original cost produces an ROI of 16 percent ($800 ÷ $5,000). Using original cost, however, may not entirely solve the valuation problem. As a result of inflation and technological advances, comparable equipment purchased at different times will have different costs. Some accountants advocate using *replacement cost* rather than *historical cost* as the valuation base. This solution is seldom used because determining the amount it would cost to replace particular assets is difficult. For example, imagine trying to determine the replacement cost of all the assets in a steel mill that has been operating for years.

Selecting the asset valuation base is a complex matter. In spite of its shortcomings, most companies use book value as the valuation base. Management must consider those shortcomings when using ROI to evaluate performance.

FACTORS AFFECTING RETURN ON INVESTMENT

LO 6

Identify factors that affect return on investment.

Management can gain insight into performance by dividing the ROI formula into two separate ratios as follows:

$$\text{ROI} = \frac{\text{Operating Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Operating assets}}$$

The first ratio on the right side of the equation is called the margin. The **margin** is a measure of management's ability to control operating expenses relative to the level of sales. In general, high margins indicate superior performance. Management can increase the margin by reducing the level of operating expenses necessary to generate sales. Decreasing operating expenses increases profitability.

The second ratio in the expanded ROI formula is called turnover. **Turnover** is a measure of the amount of operating assets employed to support the achieved level of sales. Operating assets are scarce resources. To maximize profitability, they must be used wisely. Just as excessive expenses decrease profitability, excessive investments in operating assets also limit profitability.

Both the short and expanded versions of the ROI formula produce the same end result. To illustrate, we will use the ROI for the Lumber Manufacturing Division of Panther Holding Company. Recall that the division employed $300,000 of operating assets to produce $60,000 of operating income, resulting in the following ROI:

$$\text{ROI} = \frac{\text{Operating income}}{\text{Operating assets}} = \frac{\$60{,}000}{\$300{,}000} = 20\%$$

Further analysis of the accounting records indicates the Lumber Manufacturing Division had sales of $600,000. The following computation demonstrates that the expanded ROI formula produces the same result as the short formula:

$$\begin{aligned}
\text{ROI} &= \text{Margin} \times \text{Turnover} \\
&= \frac{\text{Operating income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Operating assets}} \\
&= \frac{\$60{,}000}{\$600{,}000} \times \frac{\$600{,}000}{\$300{,}000} \\
&= .10 \times 2 \\
&= 20\%
\end{aligned}$$

The expanded formula may seem more complicated. It is generally more useful, however, because it helps managers see a variety of strategies to improve ROI. The expanded formula shows that profitability and ROI can be improved in three ways: *by increasing sales, by reducing expenses,* or *by reducing the investment base.* Each of these possibilities is demonstrated using the Lumber Manufacturing Division (LMD) of Panther Holding Company.

1. *Increase ROI by increasing sales.* Because some expenses are fixed, sales can be increased while those expenses are constant. Managers may even be able to reduce variable expenses by increasing productivity as sales increase. As a result, managers can increase their ROIs by increasing sales while limiting growth in expenses. To illustrate, assume the manager of LMD is able to increase sales from \$600,000 to \$660,000 while controlling expense growth so that net income increases from \$60,000 to \$72,600. Assuming investment in operating assets remains constant at \$300,000, ROI becomes:

$$
\begin{aligned}
\text{ROI} &= \text{Margin} \times \text{Turnover} \\
&= \frac{\text{Operating income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Operating assets}} \\
&= \frac{\$72{,}600}{\$660{,}000} \times \frac{\$660{,}000}{\$300{,}000} \\
&= .11 \times 2.2 \\
&= 24.2\%
\end{aligned}
$$

2. *Increase ROI by reducing expenses.* Suppose the manager of LMD takes a different approach. He decides to eliminate waste. By analyzing spending, he is able to cut expenses without affecting sales or the investment in operating assets. As a result of controlling expenses, operating income increases from \$60,000 to \$72,000. Assume the other variables remain the same as in the original example. ROI becomes:

$$
\begin{aligned}
\text{ROI} &= \text{Margin} \times \text{Turnover} \\
&= \frac{\text{Operating income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Operating assets}} \\
&= \frac{\$72{,}000}{\$600{,}000} \times \frac{\$600{,}000}{\$300{,}000} \\
&= .12 \times 2 \\
&= 24\%
\end{aligned}
$$

3. *Increase ROI by reducing the investment base.* Managers who focus too narrowly on income frequently overlook this possibility. Reducing the amount of funds invested in operating assets such as inventory or accounts receivable can increase profitability because the funds released can be invested in other, more productive assets. This effect is reflected in the ROI computation. For example, assume the manager of LMD launches a *just-in-time* inventory system that allows the division to reduce the amount of inventory it carries. The manager also initiates an aggressive campaign to collect receivables which significantly reduces the outstanding receivables balance. As a result of these two initiatives, the assets employed to operate LMD fall from \$300,000 to \$240,000. All other variables remain the same as in the original example. ROI becomes:

$$
\begin{aligned}
\text{ROI} &= \text{Margin} \times \text{Turnover} \\
&= \frac{\text{Operating income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Operating assets}} \\
&= \frac{\$60{,}000}{\$600{,}000} \times \frac{\$600{,}000}{\$240{,}000} \\
&= .10 \times 2.5 \\
&= 25\%
\end{aligned}
$$

The $60,000 of funds released by reducing the operating assets can be returned to headquarters or be reinvested by LMD depending on the opportunities available.

CHECK YOURSELF 9.2

What three actions can a manager take to improve ROI?

Answer

1. Increase sales
2. Reduce expenses
3. Reduce the investment base

RESIDUAL INCOME

LO 7

Evaluate investment opportunities using residual income.

Suppose Panther Holding Company evaluates the manager of the Lumber Manufacturing Division (LMD) based on his ability to maximize ROI. The corporation's overall ROI is approximately 18 percent. LMD, however, has consistently outperformed the other investment centers. Its ROI is currently 20 percent. Now suppose the manager has an opportunity to invest additional funds in a project likely to earn a 19 percent ROI. Would the manager accept the investment opportunity?

These circumstances place the manager in an awkward position. The corporation would benefit from the project because the expected ROI of 19 percent is higher than the corporate average ROI of 18 percent. Personally, however, the manager would suffer from accepting the project because it would reduce the division ROI to less than the current 20 percent. The manager is forced to choose between his personal best interests and the best interests of the corporation. When faced with decisions such as these, many managers choose to benefit themselves at the expense of their corporations, a condition described as **suboptimization.**

To avoid *suboptimization,* many businesses base managerial evaluation on **residual income.** This approach measures a manager's ability to maximize earnings above some targeted level. The targeted level of earnings is based on a minimum desired ROI. Residual income is calculated as follows:

$$\text{Residual income} = \text{Operating income} - (\text{Operating assets} \times \text{Desired ROI})$$

To illustrate, recall that LMD currently earns $60,000 of operating income with the $300,000 of operating assets it controls. ROI is 20 percent ($60,000 ÷ $300,000). Assume Panther's desired ROI is 18 percent. LMD's residual income is therefore:

$$\begin{aligned}\text{Residual income} &= \text{Operating income} - (\text{Operating assets} \times \text{Desired ROI})\\ &= \$60{,}000 - (\$300{,}000 \times .18)\\ &= \$60{,}000 - \$54{,}000\\ &= \$6{,}000\end{aligned}$$

Now assume that Panther Holding Company has $50,000 of additional funds available to invest. Because LMD consistently performs at a high level, Panther's corporate management team offers the funds to the LMD manager. The manager believes he could invest the additional $50,000 at a 19 percent rate of return.

If the LMD manager's evaluation is based solely on ROI, he is likely to reject the additional funding because investing the funds at 19 percent would lower his overall ROI. If the LMD manager's evaluation is based on residual income, however, he is likely

FOCUS ON INTERNATIONAL ISSUES

DO MANAGERS IN DIFFERENT COMPANIES STRESS THE SAME PERFORMANCE MEASURES?

About the only ratio companies are required to disclose in their annual reports to stockholders is the earnings per share ratio. Nevertheless, many companies choose to show their performance as measured by other ratios, as well as providing nonratio data not required by GAAP. The types of ratio data companies choose to include in their annual reports provides a sense of what performance measure they consider most important.

A review of several publicly traded companies from the United Kingdom, Japan, and the United States will show that the most common ratios presented are variations of the return on sales percentage and the return on investment percentage, although they may be called by different names. The country in which the company is located does not seem to determine which ratio it will emphasize.

One nonratio performance measure that is popular with companies in all three countries is free cash flow, and it is usually reported in total pounds, yen, or dollars. Be sure to exercise caution before comparing one company's free cash flow, return on sales, or return on investment to those of other companies. There are no official rules governing how these data are calculated, and different companies make different interpretations about how to compute these measurements.

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to accept the funds because an additional investment at 19 percent would increase his residual income as follows:

$$\text{Operating income} = \$50{,}000 \times .19$$
$$= \$9{,}500$$
$$\text{Residual income} = \text{Operating income} - (\text{Operating assets} \times \text{Desired ROI})$$
$$= \$9{,}500 - (\$50{,}000 \times .18)$$
$$= \$9{,}500 - \$9{,}000$$
$$= \$500$$

Accepting the new project would add $500 to LMD's residual income. If the manager of LMD is evaluated based on his ability to maximize residual income, he would benefit by investing in any project that returns an ROI in excess of the desired 18 percent. The reduction in LMD's overall ROI does not enter into the decision. The residual income approach solves the problem of suboptimization.

The primary disadvantage of the residual income approach is that it measures performance in absolute dollars. As a result, a manager's residual income may be larger simply because her investment base is larger rather than because her performance is superior.

To illustrate, return to the example where Panther Holding Company has $50,000 of additional funds to invest. Assume the manager of the Lumber Manufacturing Division (LMD) and the manager of the Furniture Manufacturing Division (FMD) each have investment opportunities expected to earn a 19 percent return. Recall that Panther's desired ROI is 18 percent. If corporate headquarters allots $40,000 of the funds to the manager of LMD and $10,000 to the manager of FMD, the increase in residual income earned by each division is as follows:

$$\text{LMD's Residual income} = (\$40{,}000 \times .19) - (\$40{,}000 \times .18) = \$400$$
$$\text{FMD's Residual income} = (\$10{,}000 \times .19) - (\$10{,}000 \times .18) = \$100$$

REALITY BYTES

Thinking about the *investment* in return on investment usually conjures up images of buildings and equipment, but investments typically include a much broader range of expenditures. For example, if **Walmart** plans to open a new store it has to make an investment in inventory to stock the store that is as permanent as the building. But investment expenditures can be for items much less tangible than inventory. Consider the making of a movie.

While it is true that making a movie can require expenditures for items such as cameras and sets, the single highest cost can often be for actors' salaries. Although movie fans may focus on how much a movie grosses at the box office, from a business perspective it is the movie's ROI that matters.

From an ROI perspective the question is, "which actors are worth the money they are paid?" To this end, BusinessWeek.com created the ROI Award for actors. Calculating ROI for an actor in a movie, rather than for the entire investment in the movie can be tricky and requires several estimates. For example, should the credit for the spectacular success of the Harry Potter movies go to its main actor, Daniel Radcliffe or the special effects, or the author, J. K. Rowling? Nevertheless, BusinessWeek.com reviewed the financial performance of movies starring various actors and actresses over the period of a few years and calculated an ROI for the leading stars.

And the winner is . . . ? In 2006 the ROI Award went to Tyler Perry who starred in *Diary of a Mad Black Woman,* and *Madea's Family Reunion.* Mr. Perry's ROI was calculated at 120 percent, suggesting that for every dollar he was paid, the movie earned $2.20 for the movie's producers. As a comparison, Tom Cruise and Will Smith had ROIs of 53 percent. Mr. Perry's movies did not sell the most tickets, but they had the highest ROIs.

Source: *BusinessWeek.com* on MSN Money, July 19, 2006.

Does LMD's higher residual income mean LMD's manager is outperforming FMD's manager? No. It means LMD's manager received more operating assets than FMD's manager received.

Calculating Multiple ROIs and/or RIs for the Same Company

You may be asked to calculate different ROI and RI measures for the same company. For example, ROI and/or RI may be calculated for the company as a whole, for segments of the company, for specific investment opportunities, and for individual managers. An example is shown in Check Yourself 9.3.

Responsibility Accounting and the Balanced Scorecard

Throughout the text we have discussed many financial measures companies use to evaluate managerial performance. Examples include standard cost systems to evaluate cost center managers; the contribution margin income statement to evaluate profit center

CHECK YOURSELF 9.3

Tambor Incorporated (TI) earned operating income of $4,730,400 on operating assets of $26,280,000 during 2011. The Western Division earned $748,000 on operating assets of $3,400,000. TI has offered the Western Division $1,100,000 of additional operating assets. The manager of the Western Division believes he could use the additional assets to generate operating income amounting to $220,000. TI has a desired return on investment (ROI) of 17 percent. Determine the ROI and RI for TI, the Western Division, and the additional investment opportunity.

(*continued*)

Answer

Return on investment (ROI) = Operating income ÷ Operating assets
ROI for TI = \$4,730,400 ÷ \$26,280,000 = 18%
ROI for Western Division = \$748,000 ÷ \$3,400,000 = 22%
ROI for Investment Opportunity = \$220,000 ÷ \$1,100,000 = 20%

Residual income (RI) = Operating income − (Operating assets × Desired ROI)
RI for TI = \$4,730,400 − (\$26,280,000 × .17) = \$262,800
RI for Western Division = \$748,000 − (\$3,400,000 × .17) = \$170,000
RI for Investment Opportunity = \$220,000 − (\$1,100,000 × .17) = \$33,000

managers; and ROI or residual income to evaluate the performance of investment center managers. Many companies may have goals and objectives such as "satisfaction guaranteed" or "we try harder" that are more suitably evaluated using nonfinancial measures. To assess how well they accomplish the full range of their missions, many companies use a *balanced scorecard.*

A **balanced scorecard** includes financial and nonfinancial performance measures. Standard costs, income measures, ROI, and residual income are common financial measures used in a balanced scorecard. Nonfinancial measures include defect rates, cycle time, on-time deliveries, number of new products or innovations, safety measures, and customer satisfaction surveys. Many companies compose their scorecards to highlight leading versus lagging measures. For example, customer satisfaction survey data is a leading indicator of the sales growth which is a lagging measure. The balanced scorecard is a holistic approach to evaluating managerial performance. It is gaining widespread acceptance among world-class companies.

<< A Look Back

The practice of delegating authority and responsibility is referred to as *decentralization.* Clear lines of authority and responsibility are essential in establishing a responsibility accounting system. In a responsibility accounting system, segment managers are held accountable for profits based on the amount of control they have over the profits in their segment.

Responsibility reports are used to compare actual results with budgets. The reports should be simple with variances highlighted to promote the *management by exception* doctrine. Individual managers should be held responsible only for those revenues or costs they control. Each manager should receive only summary information about the performance of the responsibility centers under her supervision.

A *responsibility center* is the point in an organization where control over revenue or expense is located. *Cost centers* are segments that incur costs but do not generate revenues. *Profit centers* incur costs and also generate revenues, producing a measurable profit. *Investment centers* incur costs, generate revenues, and use identifiable capital investments.

One of the primary purposes of responsibility accounting is to evaluate managerial performance. Comparing actual results with standards and budgets and calculating *return on investment* are used for this purpose. Because return on investment uses revenues, expenses, and investment, problems with measuring these parameters must be considered. The return on investment can be analyzed in terms of the margin earned on sales as well as the turnover (asset utilization) during the period. The *residual income approach* is sometimes used to avoid *suboptimization,* which occurs when managers choose to reject investment projects that would benefit their company's ROI but would reduce their investment center's ROI. The residual income approach evaluates managers based on their ability to generate earnings above some targeted level of earnings.

A Look Forward >>

The next chapter expands on the concepts you learned in this chapter. You will see how managers select investment opportunities that will affect their future ROIs. You will learn to use present value techniques that consider the time value of money; specifically, you will learn to compute the net present value and the internal rate of return for potential investment opportunities. You will also learn to use less sophisticated analytical techniques such as payback and the unadjusted rate of return.

APPENDIX

Transfer Pricing

LO 8

Describe how transfer prices may be established.

In vertically integrated companies, one division commonly sells goods or services to another division. For example, in the case of Panther Holding Company (Exhibit 9.1), the Lumber Manufacturing Division may sell lumber to the Home Building and Furniture Manufacturing Divisions. When such intercompany sales occur, the price to charge is likely to become a heated issue.

In a decentralized organization, each division is likely to be defined as an investment center. Division managers are held responsible for profitability. When goods are transferred internally, the sales price charged by the selling division becomes a cost to the buying division. The amount of profit included in the **transfer price** will increase the selling division's earnings and decrease the purchasing division's earnings (via increased expenses). The selling division benefits from getting the highest possible price; the purchasing division seeks the lowest possible price. When managers are competitively evaluated based on profitability measures, the transfer price is the subject of considerable controversy.

Companies use three common approaches to establish transfer prices: (1) price based on market forces; (2) price based on negotiation; and (3) price based on cost. Exhibit 9.4 shows some specific measures and the frequency of their use.

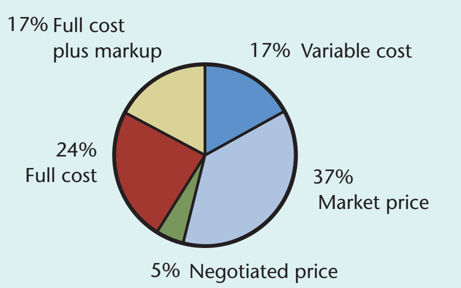
Market-Based Transfer Prices

The preferred method for establishing transfer prices is to base them on some form of competitive market price. Ideally, selling divisions should be authorized to sell merchandise to outsiders as well as, or in preference to, other divisions. Similarly, purchasing divisions should have the option to buy goods from outsiders if they are able to obtain favorable prices. However, both selling and purchasing divisions would be motivated to deal with each other because of savings in selling, administrative, and transportation costs that arise as a natural result of internal transactions.

Market-based transfer prices are preferable because they promote efficiency and fairness. Market forces coupled with the responsibility for profitability motivate managers to use their resources effectively. For example, Jerry Lowe, the manager of the lumber division, may stop producing the high-quality boards the furniture division uses if he finds it is more profitable to produce low-quality lumber. The furniture division can buy its needed material from outside companies that have chosen to operate in the less-profitable, high-quality market sector. The company as a whole benefits from Mr. Lowe's insight. An additional advantage of using market prices is the sense of fairness associated with them. It is difficult for a manager to complain that the price she is being charged is too high when she has the opportunity to seek a lower price elsewhere. The natural justice of the competitive marketplace is firmly implanted in the psyches of most modern managers.

EXHIBIT 9.4

What Companies Actually Use As Transfer Prices



Source: R. Tang, "Transfer Pricing in the 1990s," *Management Accounting,* pp. 22–26.

FOCUS ON INTERNATIONAL ISSUES

The issue of transfer pricing is mostly relevant to performance evaluation of investment centers and their managers. If a company does business in only one country, transfer prices do not affect the overall profit of the company, because the cost that will be recorded as an expense for the company as a whole is the actual cost incurred to produce it, not its transfer price. However, the situation can be different if the producing division is in one country and the acquiring division is in another. This difference occurs because income tax rates are not the same in all countries.

Assume the Global Tool Company manufactures a product in South Korea for the equivalent of $10. The product is transferred to another segment that operates in the United States where it is ultimately sold for $18. Now, assume the income tax rate is 40 percent in South Korea and 30 percent in the United States. Ignoring all other costs, what amount of taxes will the company pay if the transfer price is set at $10? What amount of taxes will the company pay if the transfer price is set at $18?

If a $10 transfer price is used, then all of the company's $8 per unit profit ($18 − $10) will be recognized in the United States. Since the item is assumed to have been "sold" in South Korea at an amount equal to its production cost, there will be no profit for the South Korean division of the company ($10 − $10 = $0). The United States division will pay $2.40 in taxes ($8 × .30 = $2.40). Conversely, if the transfer price is $18, then all of the profit will be reported in South Korea, and $3.20 per unit of taxes will be paid ($8 × .40 = $3.20).

The Internal Revenue Service has rules to prevent companies from setting transfer prices simply for the purpose of reducing taxes, but various companies have been accused of such practices over the years. Remember, it is often impossible to prove exactly what the best transfer price should be. Even though the company in our hypothetical example could not get away with such extreme transfer prices as $10 or $18, it might try to set the price a bit lower than it should be in order to shift more profit to the segment in the United States where the assumed tax rate was lower.

Despite the difficulties of proving what proper transfer prices should be, the IRS does pursue companies it believes are violating the law. In fact, as of 2006, the largest settlement in the history of the IRS involved a transfer pricing case against the British based pharmaceutical company GlaxoSmithKline. The company agreed to pay the IRS $3.4 billion to settle charges that its American unit had improperly overpaid the parent company, thus shifting profits from the United States into the United Kingdom from 1989 through 2005. With respect to the settlement, the commissioner of the IRS stated, "We have consistently said that transfer pricing is one of the most significant challenges for us in the area of corporate tax administration."*

*"IRS Accepts Settlement Offer in Largest Transfer Pricing Dispute," from the IRS website, September 11, 2006.

Negotiated Transfer Prices

In many instances, a necessary product is not available from outside companies or the market price may not be in the best interest of the company as a whole. Sometimes a division makes a unique product that is used only by one of its company's other divisions; no external market price is available to use as a base for determining the transfer price. Other times, market-based transfer prices may lead to suboptimization, discussed earlier.

Consider the case of Garms Industries. It operates several relatively autonomous divisions. One division, TrueTrust Motors, Inc., makes small electric motors for use in appliances such as refrigerators, washing machines, and fans. Another Garms division, CleanCo, makes and sells approximately 30,000 vacuum cleaners per year. CleanCo currently purchases the motors used in its vacuums from a company that is not part of Garms Industries. The president of Garms asked the TrueTrust division manager to establish a price at which it could make and sell motors to CleanCo. The manager submitted the following cost and price data.

Variable (unit-level) costs	$45
Per-unit fixed cost at a volume of 30,000 units	15
Allocated corporate level facility-sustaining costs	20
Total cost	$80

Note: TrueTrust has enough excess capacity that its existing business will not be affected by a decision to make motors for CleanCo. However, TrueTrust would be required to incur additional fixed costs to purchase equipment and hire a supervisor to make the motors that CleanCo requires.

The TrueTrust manager added a profit margin of $10 per unit and offered to provide motors to CleanCo at a price of $90 per unit. When the offer was presented to the CleanCo division manager, she rejected it. Her division was currently buying motors in the open market for $70 each. Competitive pressures in the vacuum cleaner market would not permit an increase in the sales price of her product. Accepting TrueTrust's offer would significantly increase CleanCo's costs and reduce the division's profitability.

After studying the cost data, Garms's president concluded the company as a whole would suffer from suboptimization if CleanCo were to continue purchasing motors from a third-party vendor. He noted that the allocated corporate level facility-sustaining costs were not relevant to the transfer pricing decision because they would be incurred regardless of whether TrueTrust made the motors for CleanCo. He recognized that both the variable and fixed costs were relevant because they could be avoided if TrueTrust did not make the motors. Since TrueTrust's avoidable cost of $60 ($45 variable cost + $15 fixed cost) per unit was below the $70 price per unit that CleanCo was currently paying, Garms would save $10 per motor, thereby increasing overall company profitability by $300,000 ($10 cost savings per unit × 30,000 units). The president established a reasonable range for a negotiated transfer price.

If the market price were less than the avoidable cost of production, the supplying division (TrueTrust) and the company as a whole (Garms) would be better off to buy the product than to make it. It would therefore be unreasonable to expect TrueTrust to sell a product for less than its avoidable cost of production, thereby establishing the avoidable cost as the bottom point of the reasonable range for the transfer price. On the other hand, it would be unreasonable to expect an acquiring division (CleanCo) to pay more than the price it is currently paying for motors. As a result, the market price becomes the top point of the reasonable range for the transfer price. The reasonable transfer price range can be expressed as follows:

Market price ≥ Reasonable transfer price ≥ Avoidable product cost

In the case of Garms Industries, the reasonable range of the transfer price for vacuum cleaner motors is between the market price of $70 per unit and the avoidable production cost of $60.[1] Any transfer price within this range would benefit both divisions and the company as a whole. Garms's president encouraged the two division managers to negotiate a transfer price within the reasonable range that would satisfy both parties.

[1]This discussion assumes the supplying division (TrueTrust) has excess capacity. When the supplying division is operating at full capacity and has external buyers, the minimum price for the reasonable transfer price range would include not only the avoidable cost but also an opportunity cost. An opportunity cost exists when the supplying division must forgo the opportunity to profit from sales it could otherwise make to external buyers. On the other hand, if the supplying division has enough capacity to fill both existing orders and the additional orders on which the transfer price is negotiated, the opportunity cost is zero. In other words, the supplying division does not have to give up anything to accept an order from another division. A full discussion of opportunity cost is complex. It is covered in more advanced courses.

Under the right set of circumstances, a **negotiated transfer price** can be more beneficial than a market-based transfer price. Allowing the managers involved to agree to a negotiated price preserves the notion of fairness. The element of profit remains intact and the evaluation concepts discussed in this chapter can be applied. Negotiated prices may offer many of the same advantages as market prices. They should be the first alternative when a company is unable to use market-based transfer prices.

Suppose the two division managers cannot agree on a negotiated transfer price. Should the president of Garms Industries establish a reasonable price and force the managers to accept it? There is no definitive answer to this question. However, most senior-level executives recognize the motivational importance of maintaining autonomy in a decentralized organization. So long as the negative consequences are not disastrous, division managers are usually permitted to exercise their own judgment. In other words, the long-term benefits derived from autonomous management outweigh the short-term disadvantages of suboptimization.

Cost-Based Transfer Prices

The least desirable transfer price option is a **cost-based transfer price.** To use cost, it must first be determined. Some companies base the transfer price on *variable cost* (a proxy for avoidable cost). Other companies use *full cost* (variable cost plus an allocated portion of fixed cost) as the transfer price. In either case, basing transfer prices on cost removes the profit motive. Without profitability as a goal, the incentive to control cost is diminished. One department's inefficiency is simply passed on to the next department. The result is low companywide profitability. Despite this potential detrimental effect, many companies base transfer prices on cost because cost represents an objective number that is available. When a company uses cost-based transfer prices, *it should use standard rather than actual costs.* Departments will therefore at least be responsible for the variances they generate which will encourage some degree of cost control.

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SELF-STUDY REVIEW PROBLEM

The following financial statements apply to Hola Division, one of three investment centers operated by Costa Corporation. Costa Corporation has a desired rate of return of 15%. Costa Corporation headquarters has $80,000 of additional operating assets to assign to the investment centers.

HOLA DIVISION
Income Statement
For the Year Ended December 31, 2011

Sales revenue	$78,695
Cost of goods sold	(50,810)
Gross margin	27,885
Operating expenses	
Selling expenses	(1,200)
Depreciation expense	(1,125)
Operating income	25,560
Non-operating expense	
Loss on sale of land	(3,200)
Net income	$22,360

HOLA DIVISION
Balance Sheet
As of December 31, 2011

Assets	
Cash	$ 8,089
Accounts receivable	22,870
Merchandise inventory	33,460
Equipment less acc. dep.	77,581
Non-operating assets	8,250
Total assets	$150,250
Liabilities	
Accounts payable	$ 5,000
Notes payable	58,000
Stockholders' equity	
Common stock	55,000
Retained earnings	32,250
Total liab. and stk. equity	$150,250

Required

a. Should Costa use operating income or net income to determine the rate of return (ROI) for the Hola investment center? Explain.

b. Should Costa use operating assets or total assets to determine the ROI for the Hola investment center? Explain.

c. Calculate the ROI for Hola.

d. The manager of the Hola division has an opportunity to invest the funds at an ROI of 17 percent. The other two divisions have investment opportunities that yield only 16 percent. The manager of Hola rejects the additional funding. Why would the manager of Hola reject the funds under these circumstances?

e. Calculate the residual income from the investment opportunity available to Hola and explain how residual income could be used to encourage the manager to accept the additional funds.

Solution to Requirement a

Costa should use operating income because net income frequently includes items over which management has no control, such as the loss on sale of land.

Solution to Requirement b

Costa should use operating assets because total assets frequently includes items over which management has no control, such as assets not currently in use.

Solution to Requirement c

Operating assets = Total assets − Non-operating assets ($150,250 − $8,250)
ROI = Operating income / Operating assets = $25,560 / $142,000 = 18%

Solution to Requirement d

Since the rate of return on the investment opportunity (17 percent) is below Hola's current ROI (18 percent), accepting the opportunity would decrease Hola's average ROI, which would have a negative effect on the manager's performance evaluation. While it is to the advantage of the company as a whole for Hola to accept the investment opportunity, it will reflect negatively on the manager to do so. This phenomenon is called *suboptimization.*

Solution to Requirement e

Operating income from the investment opportunity is $13,600 ($80,000 × .17)

Residual income = Operating income − (Operating assets × Desired ROI)

Residual income = $13,600 − ($80,000 × .15)

Residual income = $13,600 − $12,000

Residual income = $1,600

Since the investment opportunity would increase Hola's residual income, the acceptance of the opportunity would improve the manager's performance evaluation, thereby motivating the manager to accept it.

KEY TERMS

Balanced scorecard 412
Controllability concept 404
Cost-based transfer price 416
Cost center 401
Decentralization 400
Investment center 401
Management by exception 403
Margin 407
Market-based transfer prices 413
Negotiated transfer price 416
Profit center 401
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Transfer price 413
Turnover 407

QUESTIONS

1. Pam Kelly says she has no faith in budgets. Her company, Kelly Manufacturing Corporation, spent thousands of dollars to install a sophisticated budget system. One year later the company's expenses are still out of control. She believes budgets simply do not work. How would you respond to Ms. Kelly's beliefs?
2. All travel expenses incurred by Pure Water Pump Corporation are reported only to John Daniels, the company president. Pure Water is a multinational company with five divisions. Are travel expenses reported following the responsibility accounting concept? Explain.
3. What are five potential advantages of decentralization?
4. Who receives responsibility reports? What do the reports include?
5. How does the concept of predominant control as opposed to that of absolute control apply to responsibility accounting?
6. How do responsibility reports promote the management by exception doctrine?
7. What is a responsibility center?
8. What are the three types of responsibility centers? Explain how each differs from the others.
9. Carmen Douglas claims that her company's performance evaluation system is unfair. Her company uses return on investment (ROI) to evaluate performance. Ms. Douglas says that even though her ROI is lower than another manager's, her performance is far superior. Is it possible that Ms. Douglas is correct? Explain your position.
10. What two factors affect the computation of return on investment?
11. What three ways can a manager increase the return on investment?
12. How can a residual income approach to performance evaluation reduce the likelihood of suboptimization?
13. Is it true that the manager with the highest residual income is always the best performer?
14. Why are transfer prices important to managers who are evaluated based on profitability criteria?
15. What are three approaches to establishing transfer prices? List the most desirable approach first and the least desirable last.
16. If cost is the basis for transfer pricing, should actual or standard cost be used? Why?

MULTIPLE-CHOICE QUESTIONS

Multiple-choice questions are provided on the text website at www.mhhe.com/edmonds2011.

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EXERCISES—SERIES A

All applicable Exercises in Series A are available with McGraw-Hill's *Connect Accounting*.

Exercise 9-1A *Organization chart and responsibilities* LO 1

The production manager is responsible for the assembly, cleaning, and finishing departments. The executive vice president reports directly to the president but is responsible for the activities of the production department, the finance department, and the sales department. The sales manager is responsible for the advertising department.

Required

Arrange this information into an organization chart and indicate the responsibility levels involved.

Exercise 9-2A *Responsibility report* LO 3

Jenson Department Store is divided into three major departments: Men's Clothing, Women's Clothing, and Home Furnishings. Each of these three departments is supervised by a manager who reports to the general manager. The departments are subdivided into different sections managed by floor supervisors. The Home Furnishings Department has three floor supervisors, one for furniture, one for lamps, and one for housewares. The following items were included in the company's most recent responsibility report.

Travel expenses for the housewares buyer
Seasonal decorations for the furniture section
Revenues for the Home Furnishings Department
Administrative expenses for the Men's Clothing Department
Utility cost allocated to the Home Furnishings Department
Cost of part-time Christmas help for the Women's Department
Delivery expenses for furniture purchases
Salaries for the sales staff in the lamp section
Storewide revenues
Salary of the general manager
Salary of the Men's Clothing Department manager
Allocated companywide advertising expense
Depreciation on the facility

Required

Which items are likely to be the responsibility of the Home Furnishings Department manager?

Exercise 9-3A *Organization chart and controllable costs* LO 1

Kenta Company has employees with the following job titles.

President of the company
Vice president of marketing
Product manager
Controller
Vice president of manufacturing

Treasurer
Regional sales manager
Personnel manager
Cashier
Vice president of finance
Fringe benefits manager
Board of directors
Production supervisors
Vice president of administration
Sales office manager

Required

a. Design an organization chart using these job titles.

b. Identify some possible controllable costs for the person holding each job title.

LO 4

Exercise 9-4A *Income statement for internal use*

Ladmilla Company has provided the following 2011 data.

Budget	
Sales	$500,000
Variable product costs	204,000
Variable selling expense	50,000
Other variable expenses	3,600
Fixed product costs	16,600
Fixed selling expense	24,300
Other fixed expenses	2,200
Interest expense	800
Variances	
Sales	8,600 U
Variable product costs	4,000 F
Variable selling expense	2,500 U
Other variable expenses	1,200 U
Fixed product costs	220 F
Fixed selling expense	390 F
Other fixed expenses	150 U
Interest expense	80 F

Required

a. Prepare in good form a budgeted and actual income statement for internal use. Separate operating income from net income in the statements.

b. Calculate variances and identify them as favorable (F) or unfavorable (U).

LO 3, 4

Exercise 9-5A *Evaluating a cost center including flexible budgeting concepts*

Smiley Medical Equipment Company makes a blood pressure measuring kit. Elbert Jackson is the production manager. The production department's static budget and actual results for 2012 follow.

	Static Budget	Actual Results
Production in units	*30,000 kits*	*32,000 kits*
Direct materials	$210,000	$262,000
Direct labor	180,000	185,600
Variable manufacturing overhead	48,000	54,000
Total variable costs	438,000	501,600
Fixed manufacturing overhead	210,000	205,000
Total manufacturing cost	$648,000	$706,600

Required

a. Convert the static budget into a flexible budget.

b. Use the flexible budget to evaluate Mr. Jackson's performance.

c. Explain why Mr. Jackson's performance evaluation does not include sales revenue and net income.

Exercise 9-6A *Evaluating a profit center* — LO 2, 3

Virginia Elliott, the president of Lovely Toys Corporation, is trying to determine this year's pay raises for the store managers. Lovely Toys has seven stores in the southwestern United States. Corporate headquarters purchases all toys from different manufacturers globally and distributes them to individual stores. Additionally, headquarters makes decisions regarding location and size of stores. These practices allow Lovely Toys to receive volume discounts from vendors and to implement coherent marketing strategies. Within a set of general guidelines, store managers have the flexibility to adjust product prices and hire local employees. Ms. Elliott is considering three possible performance measures for evaluating the individual stores: cost of goods sold, return on sales (net income divided by sales), and return on investment.

Required

a. Using the concept of controllability, advise Ms. Elliott about the best performance measure.

b. Explain how a balanced scorecard can be used to help Ms. Elliott.

Exercise 9-7A *Return on investment* — LO 5

An investment center of Aguilar Corporation shows an operating income of $7,500 on total operating assets of $60,000.

Required

Compute the return on investment.

Exercise 9-8A *Return on investment* — LO 5, 6

Mitchell Company calculated its return on investment as 13 percent. Sales are now $270,000, and the amount of total operating assets is $450,000.

Required

a. If expenses are reduced by $27,000 and sales remain unchanged, what return on investment will result?

b. If both sales and expenses cannot be changed, what change in the amount of operating assets is required to achieve the same result?

Exercise 9-9A *Residual income* — LO 7

Schiavo Corporation has a desired rate of return of 8 percent. Frank Rodomil is in charge of one of Schiavo's three investment centers. His center controlled operating assets of $2,500,000 that were used to earn $260,000 of operating income.

Required

Compute Mr. Rodomil's residual income.

Exercise 9-10A *Residual income* — LO 7

Claire Cough Drops operates two divisions. The following information pertains to each division for 2010.

	Division A	Division B
Sales	$200,000	$72,000
Operating income	$ 15,040	$ 8,100
Average operating assets	$ 63,000	$45,000
Company's desired rate of return	18%	18%

Required

a. Compute each division's residual income.

b. Which division increased the company's profitability more?

LO 5, 7

Exercise 9-11A *Return on investment and residual income*

Required

Supply the missing information in the following table for Ren Company.

Sales	$396,000
ROI	?
Operating assets	?
Operating income	?
Turnover	2.2
Residual income	?
Operating profit margin	0.13
Desired rate of return	18%

LO 5, 7

Exercise 9-12A *Comparing return on investment with residual income*

The Wade Division of Geisler Corporation has a current ROI of 20 percent. The company target ROI is 15 percent. The Wade Division has an opportunity to invest $5,000,000 at 18 percent but is reluctant to do so because its ROI will fall to 19.2 percent. The present investment base for the division is $7,500,000.

Required

Demonstrate how Geisler can motivate the Wade Division to make the investment by using the residual income method.

LO 5, 6, 7

Exercise 9-13A *Return on investment and residual income*

McMillan Home Maintenance Company (MHMC) earned operating income of $7,200,000 on operating assets of $60,000,000 during 2011. The Tree Cutting Division earned $1,215,000 on operating assets of $6,750,000. MHMC has offered the Tree Cutting Division $2,050,000 of additional operating assets. The manager of the Tree Cutting Division believes he could use the additional assets to generate operating income amounting to $410,000. MHMC has a desired return on investment (ROI) of 10 percent.

Required

a. Calculate the return on investment (ROI) for MHMC, the Tree Cutting Division, and the additional investment opportunity.

b. Calculate the residual income (RI) for MHMC, the Tree Cutting Division, and the additional investment opportunity.

Appendix

LO 8

Exercise 9-14A *Transfer pricing*

Larkey Company has two divisions, A and B. Division A manufactures 6,000 units of product per month. The cost per unit is calculated as follows.

Variable costs	$ 8
Fixed costs	20
Total cost	$28

Division B uses the product created by Division A. No outside market for Division A's product exists. The fixed costs incurred by Division A are allocated headquarters-level facility-sustaining costs. The manager of Division A suggests that the product be transferred to Division B at a price of at least $28 per unit. The manager of Division B argues that the same product can be purchased from another company for $18 per unit and requests permission to do so.

Required

a. Should Larkey allow the manager of Division B to purchase the product from the outside company for $18 per unit? Explain.

b. Assume you are the president of the company. Write a brief paragraph recommending a resolution of the conflict between the two divisional managers.

Exercise 9-15A *Transfer pricing and fixed cost per unit* LO 8

The Sentry Parts Division of Camden Company plans to set up a facility with the capacity to make 10,000 units annually of an electronic computer part. The avoidable cost of making the part is as follows.

Costs	Total	Cost per Unit
Variable cost	$200,000	$30
Fixed cost	80,000	8 (at capacity)

Required

a. Assume that Camden's Norwood Division is currently purchasing 6,000 of the electronic parts each year from an outside supplier at a market price of $50. What would be the financial consequence to Camden if the Sentry Parts Division makes the part and sells it to the Norwood Division? What range of transfer prices would increase the financial performance of both divisions?

b. Suppose that the Norwood Division increases production so that it could use 10,000 units of the part made by the Sentry Parts Division. How would the change in volume affect the range of transfer prices that would financially benefit both divisions?

PROBLEMS—SERIES A

All applicable Problems in Series A are available with McGraw-Hill's *Connect Accounting*.

Problem 9-16A *Determining controllable costs* LO 3

Wayne Portera is the manager of the production department of Sun Corporation. Sun incurred the following costs during 2011.

Production department supplies	$ 6,000
Administrative salaries	400,000
Production wages	580,000
Materials used	529,200
Depreciation on manufacturing equipment	361,600
Corporate-level rental expense	240,000
Property taxes	68,600
Sales salaries	286,800

Required

Prepare a list of expenditures that Mr. Portera controls.

Problem 9-17A *Controllability, responsibility, and balanced scorecard* LO 3, 4

Ashley Peek manages the production division of Myrex Corporation. Ms. Peek's responsibility report for the month of August follows.

	Budget	Actual	Variance	
Controllable costs				
Raw materials	$23,000	$27,600	$ 4,600	U
Labor	10,000	15,295	5,295	U
Maintenance	3,200	4,600	1,400	U
Supplies	2,350	1,100	1,250	F
Total	$38,550	$48,595	$10,045	U

The budget had called for 4,600 pounds of raw materials at $5 per pound, and 4,600 pounds were used during August; however, the purchasing department paid $6 per pound for the materials. The wage rate used to establish the budget was $20 per hour. On August 1, however, it increased to $23 as the result of an inflation index provision in the union contract. Furthermore, the purchasing department did not provide the materials needed in accordance with the production schedule, which forced Ms. Peek to use 110 hours of overtime at a $34.50 rate. The projected 500 hours of labor in the budget would have been sufficient had it not been for the 110 hours of overtime. In other words, 610 hours of labor were used in August.

Required

a. When confronted with the unfavorable variances in her responsibility report, Ms. Peek argued that the report was unfair because it held her accountable for materials and labor variances that she did *not* control. Is she correct? Comment specifically on the materials and labor variances.

b. Prepare a responsibility report that reflects the cost items that Ms. Peek controlled during August.

c. Will the changes in the revised responsibility report require corresponding changes in the financial statements? Explain.

d. Explain how a balanced scorecard may be used to improve the performance evaluation.

LO 3, 4

eXcel

CHECK FIGURE

a. Total controllable costs: $387,510 (actual)

Problem 9-18A *Performance reports and evaluation*

Vance Corporation has four divisions: the assembly division, the processing division, the machining division, and the packing division. All four divisions are under the control of the vice president of manufacturing. Each division has a manager and several departments that are directed by supervisors. The chain of command runs downward from vice president to division manager to supervisor. The processing division is composed of the paint and finishing departments. The May responsibility reports for the supervisors of these departments follow.

	Budgeted*	Actual	Variance	
Paint Department				
Controllable costs				
Raw materials	$30,800	$ 31,700	$ 900	U
Labor	57,700	64,000	6,300	U
Repairs	4,800	3,870	930	F
Maintenance	2,600	2,460	140	F
Total	$95,900	$102,030	$6,130	U
Finishing Department				
Controllable costs				
Raw materials	$22,810	$ 22,560	$ 250	F
Labor	43,300	39,900	3,400	F
Repairs	2,830	3,170	340	U
Maintenance	1,680	2,050	370	U
Total	$70,620	$ 67,680	$2,940	F

*Vance uses flexible budgets for performance evaluation.

Other pertinent cost data for May follow.

	Budgeted*	Actual
Cost data of other divisions		
Assembly	$330,000	$324,300
Machining	290,000	296,400
Packing	414,950	405,700
Other costs associated with		
Processing division manager	220,000	217,800
Vice president of manufacturing	128,000	133,060

*Vance uses flexible budgets for performance evaluation.

Required

a. Prepare a responsibility report for the manager of the processing division.

b. Prepare a responsibility report for the vice president of manufacturing.

c. Explain where the $6,300 unfavorable labor variance in the paint department supervisor's report is included in the vice president's report.

d. Based on the responsibility report prepared in Requirement *a*, explain where the processing division manager should concentrate his attention.

Problem 9-19A *Different types of responsibility centers*

LO 2

Liberty National Bank is a large municipal bank with several branch offices. The bank's computer department handles all data processing for bank operations. In addition, the bank sells the computer department's expertise in systems development and excess machine time to several small business firms, serving them as a service bureau.

The bank currently treats the computer department as a cost center. The manager of the computer department prepares a cost budget annually for senior bank officials to approve. Monthly operating reports compare actual and budgeted expenses. Revenues from the department's service bureau activities are treated as other income by the bank and are not reflected on the computer department's operating reports. The costs of servicing these clients are included in the computer department reports, however.

The manager of the computer department has proposed that bank management convert the computer department to a profit or investment center.

Required

a. Describe the characteristics that differentiate a cost center, a profit center, and an investment center from each other.

b. Would the manager of the computer department be likely to conduct the operations of the department differently if the department were classified as a profit center or an investment center rather than as a cost center? Explain.

Problem 9-20A *Comparing return on investment and residual income*

LO 5, 7

CHECK FIGURE
c. 21.31%

Wells Corporation operates three investment centers. The following financial statements apply to the investment center named Huber Division.

HUBER DIVISION
Income Statement
For the Year Ended December 31, 2011

Sales revenue	$105,480
Cost of goods sold	(60,275)
Gross margin	45,205
Operating expenses	
Selling expenses	(2,840)
Depreciation expense	(4,205)
Operating income	38,160
Nonoperating item	
Gain of sale of land	(5,000)
Net income	$ 33,160

HUBER DIVISION Balance Sheet As of December 31, 2011	
Assets	
Cash	$ 12,472
Accounts receivable	40,266
Merchandise inventory	36,000
Equipment less accum. dep.	90,258
Nonoperating assets	9,000
Total assets	$187,996
Liabilities	
Accounts payable	$ 9,637
Notes payable	72,000
Stockholders' equity	
Common stock	80,000
Retained earnings	26,359
Total liab. and stk. equity	$187,996

Required

a. Which should be used to determine the rate of return (ROI) for the Huber investment center, operating income or net income? Explain your answer.

b. Which should be used to determine the ROI for the Huber investment center, operating assets or total assets? Explain your answer.

c. Calculate the ROI for Huber.

d. Wells has a desired ROI of 15 percent. Headquarters has $96,000 of funds to assign to its investment centers. The manager of the Huber Division has an opportunity to invest the funds at an ROI of 17 percent. The other two divisions have investment opportunities that yield only 16 percent. Even so, the manager of Huber rejects the additional funding. Explain why the manager of Huber would reject the funds under these circumstances.

e. Explain how residual income could be used to encourage the manager to accept the additional funds.

LO 5, 6

eXcel

CHECK FIGURES
c. 15%
d. (3) 18.75%

Problem 9-21A *Return on investment*

Soto Corporation's balance sheet indicates that the company has $300,000 invested in operating assets. During 2011, Soto earned operating income of $45,000 on $600,000 of sales.

Required

a. Compute Soto's profit margin for 2011.

b. Compute Soto's turnover for 2011.

c. Compute Soto's return on investment for 2011.

d. Recompute Soto's ROI under each of the following independent assumptions.

(1) Sales increase from $600,000 to $750,000, thereby resulting in an increase in operating income from $45,000 to $60,000.

(2) Sales remain constant, but Soto reduces expenses, resulting in an increase in operating income from $45,000 to $48,000.

(3) Soto is able to reduce its invested capital from $300,000 to $240,000 without affecting operating income.

LO 5, 6, 7

CHECK FIGURE
b. Allenby's ROI after the new investment: 13.23%

Problem 9-22A *Return on investment and residual income*

Allenby Company has operating assets of $20,000,000. The company's operating income for the most recent accounting period was $2,640,000. The Fisher Division of Allenby controls $7,500,000 of the company's assets and earned $1,170,000 of its operating income. Allenby's desired ROI is 10 percent. Allenby has $900,000 of additional funds to invest. The manager of the Fisher division believes that his division could earn $126,000 on the additional funds. The highest investment opportunity to any of the company's other divisions is 11 percent.

Required

a. If ROI is used as the sole performance measure, would the manager of the Fisher Division be likely to accept or reject the additional funding? Why or why not?

b. Would Allenby Company benefit if the manager of the Fisher Division accepted the additional funds? Why or why not?

c. If residual income is used as the sole performance measure would the manager of the Fisher Division be likely to accept or reject the additional funding? Why or why not?

Problem 9-23A *Return on investment and residual income*

LO 5, 6, 7

Windom Technologies, Inc. (WTI), has three divisions. WTI has a desired rate of return of 13 percent. The operating assets and income for each division are as follows:

Divisions	Operating Assets	Operating Income
Printer	$ 540,000	$ 96,000
Copier	810,000	90,000
Fax	360,000	54,000
Total	$1,710,000	$240,000

CHECK FIGURES

g. (4) Printer: $28,925; Copier: $(14,675); Fax: $5,950

WTI headquarters has $125,000 of additional cash to invest in one of its divisions. The division managers have identified investment opportunities that are expected to yield the following ROIs:

Divisions	Expected ROIs for Additional Investments
Printer	15.5%
Copier	13.5%
Fax	12.0%

Required

a. Which division manager is currently producing the highest ROI?

b. Based on ROI, which division manager would be most eager to accept the $125,000 of investment funds?

c. Based on ROI, which division manager would be least likely to accept the $125,000 of investment funds?

d. Which division offers the best investment opportunity for WTI?

e. What is the term used to describe the apparent conflict between Requirements *b* and *d*?

f. Explain how the residual income performance measure could be used to motivate the managers to act in the best interest of the company.

g. Calculate the residual income:

(1) at the corporate (headquarters) level before the additional investment.

(2) at the division level before the additional investment.

(3) at the investment level.

(4) at the division level after the additional investment.

h. Based on residual income, which division manager would be most eager to accept the $125,000 investment opportunity?

Appendix

Problem 9-24A *Transfer pricing*

LO 8

Landry Radio Corporation is a subsidiary of Kandell Companies. Landry makes car radios that it sells to retail outlets. It purchases speakers for the radios from outside suppliers for $28 each. Recently, Kandell acquired the Viola Speaker Corporation, which makes car radio speakers that it sells to manufacturers. Viola produces and sells approximately 200,000 speakers per year, which represents 70 percent of its operating capacity. At the present volume of activity, each

CHECK FIGURE

a. The maximum price should be $28.

speaker costs $24 to produce. This cost consists of a $16 variable cost component and an $8 fixed cost component. Viola sells the speakers for $30 each. The managers of Landry and Viola have been asked to consider using Viola's excess capacity to supply Landry with some of the speakers that it currently purchases from unrelated companies. Both managers are evaluated based on return on investment. Viola's manager suggests that the speakers be supplied at a transfer price of $30 each (the current selling price). On the other hand, Landry's manager suggests a $28 transfer price, noting that this amount covers total cost and provides Viola a healthy contribution margin.

Required

a. What transfer price would you recommend?

b. Discuss the effect of the intercompany sales on each manager's return on investment.

c. Should Viola be required to use more than excess capacity to provide speakers to Landry? In other words, should it sell to Landry some of the 200,000 units that it is currently selling to unrelated companies? Why or why not?

EXERCISES—SERIES B

LO 1

Exercise 9-1B *Organizational chart and responsibilities*

Yesterday, Fowler Corporation's board of directors appointed Suzey Cooper as the new president and chief executive officer. This morning, Ms. Cooper presented to the board a list of her management team members. The vice presidents are Joseph Cranston, regional operations; Daniel Invanisevic, research and development; and Iris Ewell, chief financial officer. Reporting to Mr. Cranston are the directors of American, European, and Asian operations. Reporting to Mr. Invanisevic are the directors of the Houston, Seattle, and Charlotte laboratories. Reporting to Ms. Ewell are the controller and the treasurer.

Required

Arrange the preceding information into an organization chart and indicate the responsibility levels involved.

LO 3

Exercise 9-2B *Responsibility report*

Fowler Corporation divides its operations into three regions: American, European, and Asian. The following items appear in the company's responsibility report.

European director's salary
Revenues of the French branch
Office expenses of the Japanese branch
Corporation president's salary
Asian director's salary
Revenues of the Taiwanese branch
Revenues of the British branch
Office expenses of the French branch
Revenues of the U.S. branch
Administrative expenses of the corporate headquarters
Office expenses of the Taiwanese branch
Office expenses of the Canadian branch
Revenues of the Japanese branch
Revenues of the Canadian branch
Office expenses of the British branch
Office expenses of the U.S. branch
American director's salary

Required

Which items should Fowler include in the responsibility report for the director of Asian operations?

Exercise 9-3B *Organizational chart and controllable cost* LO 1

Daniel Invanisevic, Corporation vice president of research and development, has overall responsibility for employees with the following positions:

Directors of the Houston, Seattle, and Charlotte laboratories
Senior researchers reporting to laboratory directors
A personnel manager in each laboratory
An accounting manager in each laboratory
Research assistants working for senior researchers
Recruiters reporting to a personnel manager
Bookkeepers reporting to an accounting manager

Required

a. Design an organization chart using these job positions.
b. Identify some possible controllable costs for persons holding each of the job positions.

Exercise 9-4B *Income statement for internal use* LO 4

McGee Company has provided the following data for 2011:

Budget	
Sales	$215,000
Variable product costs	68,000
Variable selling expense	19,500
Other variable expenses	4,000
Fixed product costs	28,000
Fixed selling expense	10,500
Other fixed expenses	1,000
Interest expense	500
Actual results	
Sales	230,000
Variable product costs	70,000
Variable selling expense	21,000
Other variable expenses	3,500
Fixed product costs	30,000
Fixed selling expense	9,600
Other fixed expenses	5,000
Interest expense	525

Required

a. Prepare in good form a budgeted and actual income statement for internal use. Separate operating income from net income in the statements.
b. Calculate variances and identify them as favorable (F) or unfavorable (U).

Exercise 9-5B *Evaluating a cost center (including flexible budgeting concepts)* LO 3

Doug Oliver, president of Oliver Door Products Company, is evaluating the performance of Gregory Wilson, the plant manager, for the last fiscal year. Mr. Oliver is concerned that production costs exceeded budget by nearly $35,000. He has available the 2011 static budget for the production plant, as well as the actual results, both of which follow:

	Static Budget	Actual Results
Production in units	5,000 Doors	5,250 Doors
Direct materials	$ 350,000	$ 362,000
Direct labor	200,000	222,000
Variable manufacturing overhead	120,000	121,800
Total variable costs	670,000	705,800
Fixed manufacturing overhead	410,000	409,000
Total manufacturing cost	$1,080,000	$1,114,800

Required

a. Convert the static budget into a flexible budget.
b. Use the flexible budget to evaluate Mr. Wilson's performance.
c. Explain why Mr. Wilson's performance evaluation doesn't include sales revenue and net income.

LO 2, 3

Exercise 9-6B *Evaluating a profit center*

Chris Gomez, president of Medina Travel Company, a travel agency, is seeking a method of evaluating her seven branches. Each branch vice president is authorized to hire employees and devise competitive strategies for the branch territory. Ms. Gomez wonders which of the following three different measures would be most suitable: return on investment, operating income, or return on sales (operating income divided by sales).

Required

a. Using the concept of controllability, advise Ms. Gomez about the best performance measure.
b. Explain how a balanced scorecard can be used for Ms. Gomez.

LO 5

Exercise 9-7B *Computing return on investment*

A Layfield Corporation investment center shows an operating income of $78,000 and an investment in operating assets of $890,000.

Required

Compute the return on investment.

LO 5, 6

Exercise 9-8B *Return on investment*

With annual sales of $4,800,000 and operating assets of $3,200,000, Nolan Company achieved a 10 percent ROI.

Required

a. If Nolan reduces expenses by $80,000 and sales remain unchanged, what ROI will result?
b. If Nolan cannot change either sales or expenses, what change in the investment base is required to achieve the same result you calculated for Requirement *a*?

LO 7

Exercise 9-9B *Computing residual income*

Mustafa Corporation's desired rate of return is 12 percent. Leeds Division, one of Mustafa's five investment centers, earned an operating income of $4,000,000 last year. The division controlled $25,000,000 of operational assets.

Required

Compute Leeds Division's residual income.

LO 7

Exercise 9-10B *Computing residual income*

Earl Oil Change operates two divisions. The following pertains to each division for 2011:

	New York	New Jersey
Sales	$1,200,000	$1,000,000
Operating income	$ 90,000	$ 60,000
Average operating assets	$300,000	$240,000
Company's desired rate of return	15%	15%

Required

a. Compute each division's residual income.
b. Which division increased the company's profitability more?

Exercise 9-11B *Supply missing information regarding return on investment and residual income*

LO 5, 7

Required

Supply the missing information in the following table for Hansen Company.

Sales	?
ROI	12%
Investment in operating assets	$450,000
Operating income	?
Turnover	?
Residual income	?
Operating profit margin	0.08
Desired rate of return	11%

Exercise 9-12B *Contrasting return on investment with residual income*

LO 5, 7

The Birmingham Division of Alabama Garage Doors, Inc., is currently achieving a 12 percent ROI. The company's target ROI is 8 percent. The division has an opportunity to invest in operating assets an additional $900,000 at 10 percent but is reluctant to do so because its ROI will fall to 11.7 percent. The division's present investment in operating assets is $4,500,000.

Required

Explain how management can use the residual income method to motivate the Birmingham Division to make the investment.

Exercise 9-13B *Return on investment and residual income*

LO 5, 6, 7

Hammod Insurance Company (HIC) earned operating income of $30,000,000 on operating assets of $240,000,000 during 2011. The Automobile Insurance Division earned $6,000,000 on operating assets of $40,000,000. HIC has offered the Automobile Division $3,625,000 of additional operating assets. The manager of the Automobile Insurance Division believes she could use the additional assets to generate operating income amounting to $480,000. HIC has a desired return on investment (ROI) of 10 percent.

Required

a. Calculate the return on investment (ROI) for HIC, the Automobile Insurance Division, and the additional investment opportunity.

b. Calculate the residual income (RI) for HIC, the Automobile Insurance Division, and the additional investment opportunity.

Appendix

Exercise 9-14B *Transfer pricing*

LO 8

Oscroft Company makes household water filtration equipment. The Aquafresh Division manufactures filters. The Sweet Water Division then uses the filters as a component of the final product Oscroft sells to consumers. The Aquafresh Division has the capacity to produce 8,000 filters per month at the following cost per unit:

Variable costs	$12
Division fixed costs	10
Allocated corporate-level facility-sustaining costs	8
Total cost per filter	$30

Sweet Water currently uses 6,000 Aquafresh filters per month. Andy Treadway, Sweet Water's manager, is not happy with the $30 transfer price charged by Aquafresh. He points out that Sweet Water could purchase the same filters from outside vendors for a market price of only $24.

Denise Cantor, Aquafresh's manager, refuses to sell the filters to Sweet Water below cost. Mr. Treadway counters that he would be happy to purchase the filters elsewhere. Because Aquafresh does not have other customers for its filters, Ms. Cantor appeals to Jim Volcker, the president of Oscroft, for arbitration.

Required

a. Should the president of Oscroft allow Mr. Treadway to purchase filters from outside vendors for $24 per unit? Explain.

b. Write a brief paragraph describing what Mr. Volcker should do to resolve the conflict between the two division managers.

LO 8

Exercise 9-15B *Transfer pricing and fixed cost per unit*

The Graca Division of Pryor Company currently produces electric fans that desktop computer manufacturers use as cooling components. The Hackney Division, which makes notebook computers, has asked the Graca Division to design and supply 20,000 fans per year for its notebook computers. Hackney currently purchases notebook fans from an outside vendor at the price of $18 each. However, Hackney is not happy with the vendor's unstable delivery pattern. To accept Hackney's order, Graca would have to purchase additional equipment and modify its plant layout. The additional equipment would enable the company to add 35,000 notebook fans to its annual production. Graca's avoidable cost of making 20,000 notebook fans follows:

Costs	Total	Per Unit
Variable costs	$120,000	$6
Fixed cost	$140,000	7

Required

a. What would be the financial consequence to Pryor Company if the Graca Division makes the notebook fans and sells them to the Hackney Division? What range of transfer prices would increase the financial performance of both divisions?

b. Suppose the Hackney Division increases production so that it could use 35,000 Graca Division notebook fans. How would the change in volume affect the range of transfer prices that would financially benefit both divisions?

PROBLEMS—SERIES B

LO 3

Problem 9-16B *Determining controllable costs*

At a professional conference just a few days ago, Victor Norman, the president of Alexander Corporation, learned how the concept of controllability relates to performance evaluation. In preparing to put this new knowledge into practice, he reviewed the financial data of the company's sales department.

Salaries of salespeople	$ 350,000
Cost of goods sold	22,500,000
Facility-level corporate costs	410,000
Travel expenses	32,000
Depreciation on equipment	100,000
Salary of the sales manager	60,000
Property taxes	4,000
Telephone expenses	39,000

Required

Help Mr. Norman prepare a list of expenditures that the sales manager controls.

Problem 9-17B *Controllability, responsibility, and balanced scorecard*

LO 3, 4

Dean Ortiz, president of Springfield Corporation, evaluated the performance report of the company's production department. Mr. Ortiz was confused by some arguments presented by Angela Sloan, the production manager. Some relevant data follow.

Variances	Amount
Materials usage variance	$100,000 U
Materials price variance	60,000 F
Labor price variance	19,000 F
Labor usage variance	69,000 U
Volume variance	150,000 U

Ms. Sloan argues that she had done a great job, noting the favorable materials price variance and labor price variance. She argued that she had had no control over factors causing the unfavorable variances. For example, she argued that the unfavorable materials usage variance was caused by the purchasing department's decision to buy substandard materials that resulted in a substantial amount of spoilage. Moreover, she argued that the unfavorable labor usage variance resulted from the substantial materials spoilage which in turn wasted many labor hours, as did the hiring of underqualified workers by the manager of the personnel department. Finally, she said that the sales department's failure to obtain a sufficient number of customer orders really caused the unfavorable volume variance.

Required

a. What would you do first if you were Dean Ortiz?

b. Did Ms. Sloan deserve the credit she claimed for the favorable variances? Explain.

c. Was Ms. Sloan responsible for the unfavorable variances? Explain.

d. Explain how a balanced scorecard can be used to improve performance evaluation.

Problem 9-18B *Performance reports and evaluation*

LO 3, 4

The mortgage division of Thorn Financial Services, Inc., is managed by a vice president who supervises three regional operations. Each regional operation has a general manager and several branches directed by branch managers.

The Bronson region has two branches, Gasden and Vance. The March responsibility reports for the managers of these branches follow.

	Budgeted*	Actual	Variance	
Gasden Branch				
Controllable costs				
Employee compensation	$288,000	$300,800	$12,800	U
Office supplies	72,000	70,000	2,000	F
Promotions	152,000	128,000	24,000	F
Maintenance	16,000	21,200	5,200	U
Total	$528,000	$520,000	$ 8,000	F
Vance Branch				
Controllable costs				
Employee compensation	$260,000	$250,000	$10,000	F
Office supplies	76,000	84,000	8,000	U
Promotions	144,000	150,000	6,000	U
Maintenance	20,000	19,200	800	F
Total	$500,000	$503,200	$ 3,200	U

*Thorn uses flexible budgets for performance evaluation.

Other pertinent cost data for March follow.

	Budgeted*	Actual
Cost data of other regions		
Helena	$1,400,000	$1,452,000
Alabaster	1,720,000	1,688,000
Other costs controllable by		
Bronson region general manager	280,000	292,000
Vice president of mortgage	384,000	392,000

*Thorn uses flexible budgets for performance evaluation.

Required

a. Prepare a responsibility report for the general manager of the Bronson region.

b. Prepare a responsibility report for the vice president of the mortgage division.

c. Explain where the $24,000 favorable promotions variance in the Gasden branch manager's report is included in the vice president's report.

d. Based on the responsibility report prepared in Requirement *a*, explain where the Bronson region's general manager should concentrate her attention.

LO 2

Problem 9-19B *Different types of responsibility centers*

Kaito Industries, Inc., has five different divisions; each is responsible for producing and marketing a particular product line. The electronics division makes cellular telephones, pagers, and modems. The division also buys and sells other electronic products made by outside companies. Each division maintains sufficient working capital for its own operations. The corporate headquarters, however, makes decisions about long-term capital investments.

Required

a. For purposes of performance evaluation, should Kaito classify its electronic division as a cost center, a profit center, or an investment center? Why?

b. Would the manager of the electronics division be likely to conduct the operations of the division differently if the division were classified as a different type of responsibility center than the one you designated in Requirement *a*? Explain.

LO 5, 7

Problem 9-20B *Comparing return on investment and residual income*

Zimmerman Corporation operates three investment centers. The following financial statements apply to the investment center named Meier Division.

MEIER DIVISION
Income Statement
For the Year Ended December 31, 2011

Sales revenue	$250,975
Cost of goods sold	(128,635)
Gross margin	122,340
Operating expenses	
Selling expenses	(13,200)
Administrative expense	(2,400)
Operating income	106,740
Nonoperating expense	
Interest expense	(6,800)
Net income	$ 99,940

MEIER DIVISION Balance Sheet As of December 31, 2011	
Assets	
Cash	$ 68,360
Accounts receivable	380,290
Merchandise inventory	53,750
Equipment less accum. dep.	428,600
Nonoperating assets	48,000
Total assets	$979,000
Liabilities	
Accounts payable	$115,000
Notes payable	100,000
Stockholders' equity	
Common stock	520,000
Retained earnings	244,000
Total liab. and stk. equity	$979,000

Required

a. Should operating income or net income be used to determine the rate of return (ROI) for the Meier investment center? Explain your answer.

b. Should operating assets or total assets be used to determine the ROI for the Meier investment center? Explain your answer.

c. Calculate the ROI for Meier.

d. Zimmerman has a desired ROI of 8 percent. Headquarters has $300,000 of funds to assign to its investment centers. The manager of the Meier Division has an opportunity to invest the funds at an ROI of 10 percent. The other two divisions have investment opportunities that yield only 9 percent. Even so, the manager of Meier rejects the additional funding. Explain why the manager of Meier would reject the funds under these circumstances.

e. Explain how residual income could be used to encourage the manager to accept the additional funds.

Problem 9-21B *Return on investment* LO 5, 6

Clifton Corporation's balance sheet indicates that the company has $100,000 invested in operating assets. During 2011, Clifton earned $16,000 of operating income on $320,000 of sales.

Required

a. Compute Clifton's operating profit margin for 2011.

b. Compute Clifton's turnover for 2011.

c. Compute Clifton's return on investment for 2011.

d. Recompute Clifton's ROI under each of the following independent assumptions.

(1) Sales increase from $320,000 to $360,000, thereby resulting in an increase in operating income from $16,000 to $18,900.

(2) Sales remain constant, but Clifton reduces expenses, thereby resulting in an increase in income from $16,000 to $16,800.

(3) Clifton is able to reduce its operating assets from $100,000 to $96,000 without affecting income.

Problem 9-22B *Return on investment and residual income* LO 5, 6, 7

Emery Company has operating assets of $3,600,000. The company's operating income for the most recent accounting period was $407,000. The Lindburg Division of Emery controls $1,200,000 of the company's assets and earned $175,000 of its operating income. Emery's desired ROI is 10 percent. Emery has $300,000 of additional funds to invest. The manager of the Lindburg Division believes that his division could earn $36,000 on the additional funds. The highest investment opportunity to any of the company's other divisions is 11 percent.

Required

a. If ROI is used as the sole performance measure, would the manager of the Lindburg Division be likely to accept or reject the additional funding? Why or why not?

b. Would Emery Company benefit if the manager of the Lindburg Division accepted the additional funds? Why or why not?

c. If residual income is used as the sole performance measure, would the manager of the Lindburg Division be likely to accept or reject the additional funding? Why or why not?

LO 5, 6, 7

Problem 9-23B *Return on investment and residual income*

Otway Trading Company (OTC) has three divisions. OTC has a desired rate of return of 14%. The operating assets and income for each division are as follows:

Divisions	Operating Assets	Operating Income
Americas	$1,920,000	$345,000
Asia	965,000	160,400
Europe	1,215,000	165,000
Total	$4,100,000	$670,400

OTC headquarters has $30,000 of additional cash to invest in one of its divisions. The division managers have identified investment opportunities that are expected to yield the following ROIs.

Divisions	Expected ROIs for Additional Investments
Americas	16%
Asia	12
Europe	15

Required

a. Which division manager is currently producing the highest ROI?

b. Based on ROI, which division manager would be most eager to accept the $30,000 of investment funds?

c. Based on ROI, which division manager would be least likely to accept the $30,000 of investment funds?

d. Which division offers the best investment opportunity for OTC?

e. What is the term used to describe the apparent conflict between Requirements *b* and *d*?

f. Explain how the residual income performance measure could be used to motivate the managers to act in the best interest of the company.

g. Calculate the residual income:

(1) At the corporate (headquarters) level before the additional investment.

(2) At the division level before the additional investment.

(3) At the investment level.

(4) At the division level after the additional investment.

h. Based on residual income, which division manager would be most eager to accept the $30,000 investment opportunity?

Appendix

Problem 9-24B *Transfer pricing*

LO 8

Laya Electronics Corporation makes a modem that it sells to retail stores for $75 each. The variable cost to produce a modem is $35 each; the total fixed cost is $5,000,000. Laya is operating at 80 percent of capacity and is producing 200,000 modems annually. Laya's parent company, Ocean Corporation, notified Laya's president that another subsidiary company, Leap Technologies, has begun making computers and can use Laya's modem as a part. Leap needs 40,000 modems annually and is able to acquire similar modems in the market for $72 each.

Under instructions from the parent company, the presidents of Laya and Leap meet to negotiate a price for the modem. Laya insists that its market price is $75 each and will stand firm on that price. Leap, on the other hand, wonders why it should even talk to Laya when Leap can get modems at a lower price.

Required

a. What transfer price would you recommend?

b. Discuss the effect of the intercompany sales on each president's return on investment.

c. Should Laya be required to use more than excess capacity to provide modems to Leap if Leap's demand increases to 60,000 modems? In other words, should it sell some of the 200,000 modems that it currently sells to unrelated companies to Leap instead? Why or why not?

ANALYZE, THINK, COMMUNICATE

ATC 9-1 Business Applications Case *Analyzing segments at Coca-Cola*

The following excerpt is from Coca-Cola Company's 2008 annual report filed with the SEC.

> Management evaluates the performance of our operating segments separately to individually monitor the different factors affecting financial performance. Our Company manages income taxes and financial costs, such as interest income and expense, on a global basis within the Corporate operating segment. We evaluate segment performance based on income or loss before income taxes.

Below are selected segment data for Coca-Cola Company for the 2008 and 2007 fiscal years. Dollar amounts are in millions.

	Eurasia & Africa	Europe	Latin America	North America	Pacific
2008 Fiscal Year					
Net operating revenues	$2,327	$5,801	$3,835	$ 8,280	$4,695
Income before taxes	811	3,182	2,082	1,587	1,836
Identifiable operating assets	956	3,012	1,849	10,845	1,444
2007 Fiscal Year					
Net operating revenues	$2,109	$5,292	$3,244	$ 7,836	$4,406
Income before taxes	696	2,796	1,752	1,665	761
Identifiable operating assets	1,023	2,997	1,989	10,510	1,468

Required

a. Compute the ROI for each of Coke's geographical segments for each fiscal year. Which segment appears to have the best performance during 2008 based on ROI? Which segment showed the most improvement from 2007 to 2008?

b. What factor seems most important in explaining why the ROI for North America is so much lower that the ROIs of other segments?

c. Assuming Coke's management expects a minimum return of 30 percent, calculate the residual income for each segment for each fiscal year. Which segment appears to have the best performance based on residual income? Which segment showed the most improvement from 2007 to 2008?

d. Explain why the segment with the highest ROI in 2008 is not the segment with the highest residual income.

e. Assume the management of Coke is considering a major expansion effort for the next five years. On which geographic segment would you recommend Coke focus its expansion efforts? Explain the rationale for your answer.

ATC 9-2 Group Assignment *Return on investment versus residual income*

Bellco, a division of Becker International Corporation, is operated under the direction of Antoin Sedatt. Bellco is an independent investment center with approximately $72,000,000 of assets that generate approximately $8,640,000 in annual net income. Becker International has additional investment capital of $12,000,000 that is available for the division managers to invest. Mr. Sedatt is aware of an investment opportunity that will provide an 11 percent annual net return. Becker International's desired rate of return is 10 percent.

Required

Divide the class into groups of four or five students and then organize the groups into two sections. Assign Task 1 to the first section and Task 2 to the second section.

Group Tasks

1. Assume that Mr. Sedatt's performance is evaluated based on his ability to maximize return on investment (ROI). Compute ROI using the following two assumptions: Bellco retains its current asset size and Bellco accepts and invests the additional $12,000,000 of assets. Determine whether Mr. Sedatt should accept the opportunity to invest additional funds. Select a spokesperson to present the decision made by the group.
2. Assume that Mr. Sedatt's performance is evaluated based on his ability to maximize residual income. Compute residual income using the following two assumptions: Bellco retains its current asset base and Bellco accepts and invests the additional $12,000,000 of assets. Determine whether Mr. Sedatt should accept the opportunity to invest additional funds. Select a spokesperson to present the decision made by the group.
3. Have a spokesperson from one of the groups in the first section report the two ROIs and the group's recommendation for Mr. Sedatt. Have the groups in this section reach consensus on the ROI and the recommendation.
4. Have a spokesperson from the second section report the two amounts of residual income and disclose the group's recommendation for Mr. Sedatt. Have this section reach consensus on amounts of residual income.
5. Which technique (ROI or residual income) is more likely to result in suboptimization?

ATC 9-3 Research Assignment *Using real-world data from Berkshire Hathaway*

Obtain **Berkshire Hathaway's** (Berkshire) Form 10-K for the year ended December 31, 2008, and complete the requirements below. To obtain the Form 10-K you can use either the EDGAR system following the instructions in Appendix A, or it can be found under on the company's corporate website **www.berkshirehathaway.com**. The company's annual reports are also available on its website.

Required

a. Unlike most companies, Berkshire organizes the revenues and expenses on its earnings statements, and the assets and liabilities on its balance sheets, by major business segments. Calculate the return on investment for each segment of Berkshire's business using the *margin* × *turnover* method. For segment earnings, use earnings before taxes, which you will have to calculate. Show your computations.

b. Rank the segments' performance from best to worst, based on their ROIs.

c. Why did the best-performing segment do better than the next best? Was it profitability, the efficiency with which it used its assets, or both?

ATC 9-4 Writing Assignment *Transfer pricing*

Green Lawn Mower, Inc., recently acquired Hallit Engines, a small engine manufacturing company. Green's president believes in decentralization and intends to permit Hallit to continue to operate as an independent entity. However, she has instructed the manager of Green's lawn mower assembly division to investigate the possibility of purchasing engines from Hallit instead of using the current third-party supplier. Hallit has excess capacity. The current full cost to produce each engine is $96. The avoidable cost of making engines is $78 per unit. The assembly division, which currently pays the third-party supplier $90 per engine, offers to purchase engines from Hallit at the $90 price. Hallit's president refuses the offer, stating that his company's engines are superior to those the third-party supplier provides. Hallit's president believes that the transfer price should be based on the market price for independent customers, which is $132 per engine. The manager of the assembly division agrees that Hallit's engines are higher quality than those currently being used but notes that Green's customer base is in the low-end, discount market. Putting more expensive engines on Green mowers would raise the price above the competition and would hurt sales. Green's president tries to negotiate a settlement between the assembly manager and Hallit's president, but the parties are unable to agree on a transfer price.

Required

a. Assuming that Green makes and sells 40,000 lawn mowers per year, what is the cost of suboptimization resulting from the failure to establish a transfer price?

b. Assume that you are a consultant asked by the president of Green to recommend whether a transfer price should be arbitrarily imposed. Write a brief memo that includes your recommendation and your justification for making it.

ATC 9-5 Ethical Dilemma *Manipulating return on investment and residual income*

The October 5, 1998, issue of *BusinessWeek* includes the article "Who Can You Trust?" authored by Sarah Bartlett. Among other dubious accounting practices, the article describes a trick known as the "big bath," which occurs when a company makes huge unwarranted asset write-offs that drastically overstate expenses. Outside auditors (CPAs) permit companies to engage in the practice because the assets being written off are of questionable value. Because the true value of the assets cannot be validated, auditors have little recourse but to accept the valuations suggested by management. Recent examples of questionable write-offs include **Motorola's** $1.8 billion restructuring charge and the multibillion-dollar write-offs for "in-process" research taken by high-tech companies such as **Compaq Computer Corp.** and **WorldCom, Inc.**

Required

a. Why would managers want their companies to take a big bath? (*Hint:* Consider how a big bath affects return on investment and residual income in the years following the write-off.)

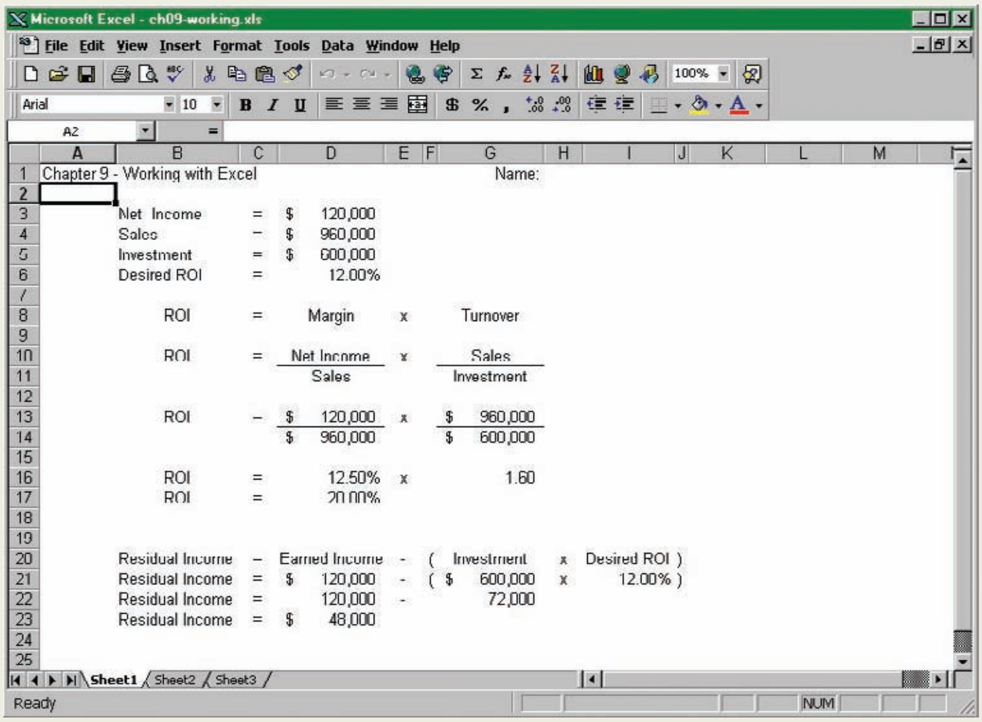
b. Annual reports are financial reports issued to the public. The reports are the responsibility of auditors who are CPAs who operate under the ethical standards promulgated by the American Institute of Certified Public Accountants. As a result, attempts to manipulate annual report data are not restricted by the Institute of Management Accountants Standards of Ethical Conduct shown in Exhibit 1.15 of Chapter 1. Do you agree or disagree with these statements? Explain your position.

ATC 9-6 Spreadsheet Assignment *Using Excel*

Waldon Corporation's balance sheet shows that the company has $600,000 invested in operating assets. During 2010, Waldon earned $120,000 on $960,000 of sales. The company's desired return on investment (ROI) is 12 percent.

Required

a. Construct a spreadsheet to calculate ROI and residual income using these data. Build the spreadsheet using formulas so that the spreadsheet could be used as a template for any ROI or residual income problem. The following screen capture shows how to construct the template.



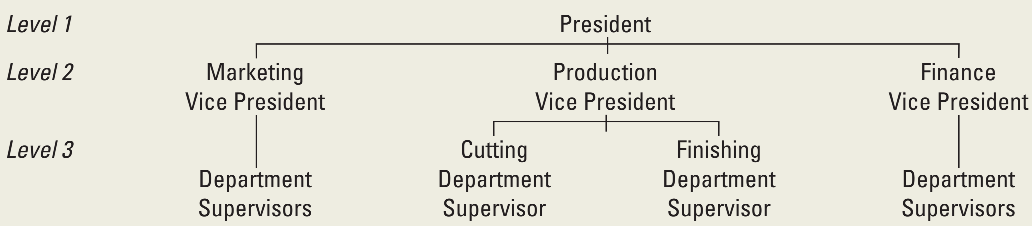
Spreadsheet Tips

(1) The cells below row 12 that show numbers should all be based on formulas. This allows the results to be automatically recalculated based on changes in the data rows 3 to 6.

(2) The parentheses in columns F and J have been entered as text in columns that have a column width of 1.

ATC 9-7 Spreadsheet Assignment *Mastering Excel*

The Pillar Manufacturing Company has three identified levels of authority and responsibility. The organization chart as of December 31, 2011, appears as follows:



Pertinent expenses for Level 3 follow:

	Budget	Actual
Finishing Department		
Wages expense	$6,240	$6,000
Direct materials	2,300	2,400
Supplies	840	980
Small tools	1,300	1,140
Other	700	820

Pertinent expenses for Level 2 follow:

	Budget	Actual
Production Department		
Administrative expenses	$ 1,200	$ 1,400
Supervisory salaries	5,800	5,200
Cutting Department	6,800	6,420
Finishing Department	11,380	11,340

Pertinent expenses for Level 1 follow:

	Budget	Actual
President's Office Expense		
Supervisory salaries	$ 4,900	$ 5,100
Clerical staff	800	400
Other expenses	600	700
Production Department	25,180	24,360
Marketing Department	8,850	8,300
Finance Department	5,900	6,220

Required

a. Construct a spreadsheet that shows responsibility reports for the finishing department supervisor, the production vice president, and the president.

b. Include formulas in the responsibility reports that illustrate the interrelationships between these reports. For example, changes in the finishing department report should be automatically reflected in the production department report.

Spreadsheet Tip

(1) Use the absolute value function [=ABS(value)] in the formulas that calculate the variances.

COMPREHENSIVE PROBLEM

Assume Magnificent Modems (MM) is a division of Gilmore Business Products (GBP). GBP uses ROI as the primary measure of managerial performance. GBP has a desired return on investment (ROI) of 3 percent. The company has $100,000 of investment funds to be assigned to its divisions. The president of MM is aware of an investment opportunity for these funds that is expected to yield an ROI of 3.5 percent.

Required

a. Explain why you believe the president of MM will accept or reject the $100,000 investment opportunity. Support your answer by calculating MM's existing ROI. Base your computation on the information contained in the income statement and balance sheet that you prepared in Chapter 1 (page 52).

b. Name the term used to describe the condition that exists in Requirement *a*. Provide a brief definition of this term.

c. If GBP changes its performance measurement criteria from ROI to residual income (RI), will the new evaluation approach affect the President's decision to accept or reject the $100,000 investment opportunity? Support your answer by calculating MM's residual income for the investment opportunity.