CHAPTER 15

Performance Evaluation

LEARNING OBJECTIVES

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

1. Describe the concept of decentralization.
2. Distinguish between flexible and static budgets.
3. Classify variances as being favorable or unfavorable.
4. Compute and interpret sales and variable cost volume variances.
5. Compute and interpret flexible budget variances.
6. Evaluate investment opportunities using the return on investment technique.
7. Evaluate investment opportunities using the residual income technique.

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

Gourmet Pizzas is located in an affluent section of a major metropolitan area. Its owner worked at a national-chain pizza restaurant while in college. He knew that even though the national pizza chains had a lot of stores, (in 2010 **Domino's**, **Pizza Hut**, and **Papa John's** had approximately 14,000 stores in the United States), more than half of the country's pizzas were sold by other, mostly independently owned, restaurants. Knowing he could not beat the big guys on price, Gourmet Pizzas focuses on quality. Its pizza dough is made from scratch on the premises from organically grown flour, and it offers a wide variety of unusual toppings, such as pancetta.

In order to determine a proper selling price for his pizzas, the owner estimated the cost of making the crusts, among other things. Knowing how much flour, yeast, and so on was needed to make the dough for one pizza and estimating the cost of these ingredients, he determined that the materials for the dough for each pizza should cost him 25 cents. However, after six months in business, he had spent $10,150 on materials for making his dough and had sold 32,750 pizzas. This resulted in an actual cost per pizza of 31 cents.

What are two general reasons that may explain why the materials cost for pizza dough was higher than Gourmet Pizzas' owner estimated? (Answer on page 533.)

Sources: Companies' SEC filings and **PMQ.com**.

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.**

Responsibility 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 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. 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. 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. Managers of investment centers are accountable for assets and liabilities as well as earnings.

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.

Because 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.

Answers to The Curious Accountant

As this chapter demonstrates, there are two primary reasons a company spends more or less to produce a product than it estimated it would. First, the company may have paid more or less to purchase the inputs needed to produce the product than it estimated. Second, the company used a greater or lesser quantity of these inputs than expected. In the case of Gourmet Pizzas, it may have had to pay more for flour, yeast, cheese, and so on than the owner estimated. Or, it may have used more of these ingredients than expected. For example, if pizza dough sits around too long before being used, it may have to be thrown out. This waste was not anticipated when computing the cost to make only one pizza. Of course, the higher than expected cost could have been a combination of price and quantity factors.

Gourmet Pizza needs to determine if the difference between its expected costs and actual costs was because the estimates were faulty, or because the production process was inefficient. If the estimates were to blame, the owner would need to revise them so he can charge the proper price to his customers. If the production process is inefficient, he needs to correct it if he is to earn an acceptable level of profit.

PREPARING FLEXIBLE BUDGETS

LO 2

Distinguish between flexible and static budgets.

A **flexible budget** is an extension of the *master budget* discussed previously. The master budget is based solely on the planned volume of activity. The master budget is frequently called a **static budget** because it remains unchanged even if the actual volume of activity differs from the planned volume. Flexible budgets differ from static budgets in that they show expected revenues and costs at a *variety* of volume levels.

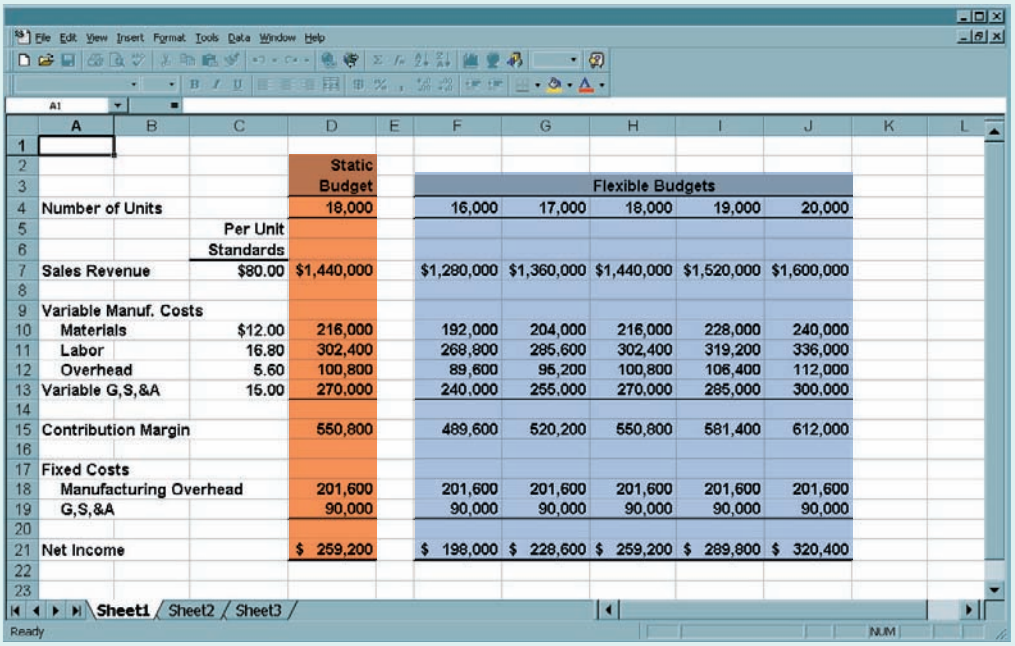
To illustrate the differences between static and flexible budgets, consider Melrose Manufacturing Company, a producer of small, high-quality trophies used in award ceremonies. Melrose plans to make and sell 18,000 trophies during 2011. Management's best estimates of the expected sales price and per unit costs for the trophies are called *standard* prices and costs. The standard price and costs for the 18,000 trophies follow.

Per unit sales price and variable costs	
Expected sales price	$80.00
Standard materials cost	12.00
Standard labor cost	16.80
Standard overhead cost	5.60
Standard general, selling, and administrative cost	15.00
Fixed costs	
Manufacturing overhead cost	$201,600
General, selling, and administrative cost	90,000

The static budget is highlighted with orange shading in Exhibit 15.1. Sales revenue is determined by multiplying the expected sales price per unit times the planned volume of activity ($80 × 18,000 = $1,440,000). Similarly, the variable costs are calculated by multiplying the standard cost per unit times the planned volume of activity. For example, the manufacturing materials cost is $216,000 ($12 × 18,000). The same computational procedures apply to the other variable costs. The variable costs are subtracted from the sales revenue to produce a contribution margin of $550,800. The fixed costs are subtracted from the contribution margin to produce a budgeted net income of $259,200.

EXHIBIT 15.1

Static and Flexible Budgets in Excel Spreadsheet



	A	B	C	D	E	F	G	H	I	J	K	L
1												
2				Static								
3				Budget		Flexible Budgets						
4	Number of Units			18,000		16,000	17,000	18,000	19,000	20,000		
5			Per Unit									
6			Standards									
7	Sales Revenue		$80.00	$1,440,000		$1,280,000	$1,360,000	$1,440,000	$1,520,000	$1,600,000		
8												
9	Variable Manuf. Costs											
10	Materials		$12.00	216,000		192,000	204,000	216,000	228,000	240,000		
11	Labor		16.80	302,400		268,800	285,600	302,400	319,200	336,000		
12	Overhead		5.60	100,800		89,600	95,200	100,800	106,400	112,000		
13	Variable G,S,&A		15.00	270,000		240,000	255,000	270,000	285,000	300,000		
14												
15	Contribution Margin			550,800		489,600	520,200	550,800	581,400	612,000		
16												
17	Fixed Costs											
18	Manufacturing Overhead			201,600		201,600	201,600	201,600	201,600	201,600		
19	G,S,&A			90,000		90,000	90,000	90,000	90,000	90,000		
20												
21	Net Income			$ 259,200		$ 198,000	$ 228,600	$ 259,200	$ 289,800	$ 320,400		
22												
23												

Sheet1 / Sheet2 / Sheet3

Ready NUM

What happens if the number of units sold is different from the planned volume? In other words, *what* happens to net income *if* Melrose sells more or less than 18,000 units? Managers frequently use flexible budgets to examine such *what if* scenarios. Flexible budget income statements for Melrose at sales volumes of 16,000, 17,000, 18,000, 19,000, and 20,000 are highlighted with blue shading in Exhibit 15.1.

The flexible budgets are prepared with the same per-unit standard amounts and fixed cost data used to produce the static budget. The only difference is the expected number of units sold. For example, the sales revenue at 16,000 units is $1,280,000 ($80 × 16,000), at 17,000 units it is $1,360,000 ($80 × 17,000), and so on. The variable materials cost at 16,000 units is $192,000 ($12 × 16,000), at 17,000 units it is $204,000 ($12 × 17,000), and so on. The other variable costs are computed in the same manner. Note that the fixed costs are the same at all levels of activity because, by definition, they are not affected by changes in volume.

Other flexible budgets are possible. Indeed, a flexible budget can be prepared for any number of units sold. You have probably noticed that Exhibit 15.1 was prepared using an Excel spreadsheet. Excel offers the opportunity to prepare an unlimited number of flexible budgets with minimal effort. For example, formulas can be created with cell references so that new budgets can be created simply by changing the number of units entered in a single cell.

Managers use flexible budgets for both planning and performance evaluation. For example, managers may assess whether the company's cash position is adequate by assuming different levels of volume. They may judge if the number of employees, amounts of materials, and equipment and storage facilities are appropriate for a variety of different potential levels of volume. In addition to helping plan, flexible budgets are critical to implementing an effective performance evaluation system.

CHECK YOURSELF 15.1

The static (master) budget of Parcel, Inc., called for a production and sales volume of 25,000 units. At that volume, total budgeted fixed costs were $150,000 and total budgeted variable costs were $200,000. Prepare a flexible budget for an expected volume of 26,000 units.

Answer Budgeted fixed costs would remain unchanged at $150,000 because changes in the volume of activity do not affect budgeted fixed costs. Budgeted variable costs would increase to $208,000, computed as follows: Calculate the budgeted variable cost per unit ($200,000 ÷ 25,000 units = $8) and then multiply that variable cost per unit by the expected volume ($8 × 26,000 units = $208,000).

DETERMINING VARIANCES FOR PERFORMANCE EVALUATION

LO 3

Classify variances as being favorable or unfavorable.

One means of evaluating managerial performance is to compare *standard* amounts with *actual* results. The differences between the standard and actual amounts are called **variances;** variances can be either **favorable** or **unfavorable.** When actual sales revenue is greater than expected (planned) revenue, a company has a favorable sales variance because higher sales increase net income. When actual sales are less than expected, an unfavorable sales variance exists. When actual costs are *less* than standard costs, cost variances are favorable because lower costs increase net income. Unfavorable cost variances exist when actual costs are *more* than standard costs. These relationships are summarized below.

- When actual sales exceed expected sales, variances are favorable.
- When actual sales are less than expected sales, variances are unfavorable.
- When actual costs exceed standard costs, variances are unfavorable.
- When actual costs are less than standard costs, variances are favorable.

SALES AND VARIABLE COST VOLUME VARIANCES

LO 4

Compute and interpret sales and variable cost volume variances.

The amount of a **sales volume variance** is the difference between the static budget (which is based on planned volume) and a flexible budget based on actual volume. Likewise, the **variable cost volume variances** are determined by calculating the differences between the static and flexible budget amounts. These variances measure management effectiveness in attaining the planned volume of activity. To illustrate, assume Melrose Manufacturing Company actually makes and sells 19,000 trophies during 2011. The planned volume of activity was 18,000 trophies. Exhibit 15.2 shows Melrose's static budget, flexible budget, and volume variances.

Interpreting the Sales and Variable Cost Volume Variances

Because the static and flexible budgets are based on the same standard sales price and per-unit variable costs, the variances are solely attributable to the difference between the planned and actual volume of activity. Marketing managers are usually responsible for the volume variances. Because the sales volume drives production levels, production managers have little control over volume. Exceptions occur; for example, if poor production quality control leads to inferior goods that are difficult to sell, the production

EXHIBIT 15.2

Melrose Manufacturing Company's Volume Variances

	Static Budget	Flexible Budget	Volume Variances	
Number of units	18,000	19,000	1,000	Favorable
Sales revenue	$1,440,000	$1,520,000	$80,000	Favorable
Variable manufacturing costs				
Materials	216,000	228,000	12,000	Unfavorable
Labor	302,400	319,200	16,800	Unfavorable
Overhead	100,800	106,400	5,600	Unfavorable
Variable G, S, & A	270,000	285,000	15,000	Unfavorable
Contribution margin	550,800	581,400	30,600	Favorable
Fixed costs				
Manufacturing overhead	201,600	201,600	0	
G, S, & A	90,000	90,000	0	
Net income	$ 259,200	$ 289,800	$30,600	Favorable

manager is responsible. The production manager is responsible for production delays that affect product availability, which may restrict sales volume. Under normal circumstances, however, the marketing campaign determines the volume of sales. Upper-level marketing managers develop the promotional program and create the sales plan; they are in the best position to explain why sales goals are or are not met. When marketing managers refer to **making the numbers,** they usually mean reaching the sales volume in the static (master) budget.

In the case of Melrose Manufacturing Company, the marketing manager not only achieved but also exceeded by 1,000 units the planned volume of sales. Exhibit 15.2 shows the activity variances resulting from the extra volume. At the standard price, the additional volume produces a favorable revenue variance of $80,000 (1,000 units × $80 per unit). The increase in volume also produces unfavorable variable cost variances. The net effect of producing and selling the additional 1,000 units is an increase of $30,600 in the contribution margin, a positive result. These preliminary results suggest that the marketing manager is to be commended. The analysis, however, is incomplete. For example, examining market share could reveal whether the manager won customers from competitors or whether the manager simply reaped the benefit of an unexpected industrywide increase in demand. The increase in sales volume could have been attained by reducing the sales price; the success of that strategy will be analyzed further in a later section of this chapter.

Because the variable costs in the flexible budget are higher than the variable costs in the static budget, the variable cost volume variances are *unfavorable.* The unfavorable classification may be misleading because it focuses solely on the cost component of the income statement. While costs are higher than expected, so too may be revenue. Indeed, as shown in Exhibit 15.2, the total of the unfavorable variable cost variances is more than offset by the favorable revenue variance, resulting in a higher contribution margin. Frequently, the assessment of variances requires a holistic perspective.

Fixed Cost Considerations

The fixed costs are the same in both the static and flexible budgets. By definition, the budgeted amount of fixed costs remains unchanged regardless of the volume of activity. However, this does not mean that there will be no fixed cost variances. Companies may certainly pay more or less than expected for a fixed cost. For example, a supervisor may receive an unplanned raise, causing actual salary costs to be more than the costs shown in the static budget. The difference between the *budgeted* fixed

costs and the *actual* fixed costs is called a **spending variance.** Spending variances will be discussed in more detail later in the chapter. At this point, it is important to note that the reason the fixed cost variances shown in Exhibit 15.2 are zero is because we are comparing two budgets (static versus flexible). Because total fixed cost is not affected by the level of activity, there will be no fixed cost variances associated with static versus flexible budgets.

While total fixed cost does not change in response to changes in the volume of activity, fixed cost per unit does change. Changes in the fixed cost per unit have important implications for decision making. For example, consider the impact on cost-plus pricing decisions. Because actual volume is unknown until the end of the year, selling prices must be based on planned volume. At the *planned volume* of activity of 18,000 units, Melrose's fixed cost per unit is expected to be as follows.

Fixed manufacturing cost	$201,600
Fixed G, S, & A cost	90,000
Total fixed cost	$291,600 ÷ 18,000 units = $16.20 per trophy

Based on the *actual volume* of 19,000 units, the fixed cost per unit is actually $15.35 per trophy ($291,600 ÷ 19,000 units). Because Melrose's prices were established using the $16.20 budgeted cost at planned volume rather than the $15.35 budgeted cost at actual volume, the trophies were overpriced, giving competitors a price advantage. Although Melrose sold more trophies than expected, sales volume might have been even greater if the trophies had been competitively priced.

Underpricing (not encountered by Melrose in this example) can also be detrimental. If planned volume is overstated, the estimated fixed cost per unit will be understated and prices will be set too low. When the higher amount of actual costs is subtracted from revenues, actual profits will be lower than expected. To monitor the effects of volume on fixed cost per unit, companies frequently calculate a **fixed cost volume variance.**

The fixed cost volume variance is *unfavorable* if actual volume is less than planned because cost per unit is higher than expected. Conversely, if actual volume is greater than planned, cost per unit is less than expected, resulting in a *favorable* variance. Both favorable and unfavorable variances can have negative consequences. Managers should strive for the greatest possible degree of accuracy.

FLEXIBLE BUDGET VARIANCES

LO 5

Compute and interpret flexible budget variances.

For performance evaluation, management compares actual results to a flexible budget based on the *actual* volume of activity. Because the actual results and the flexible budget reflect the same volume of activity, any variances in revenues and variable costs result from differences between standard and actual per unit amounts. To illustrate computing and analyzing flexible budget variances, we assume that Melrose's *actual* per unit amounts during 2011 were those shown in the following table. The 2011 per unit *standard* amounts are repeated here for your convenience.

	Standard	Actual
Sales price	$80.00	$78.00
Variable materials cost	12.00	11.78
Variable labor cost	16.80	17.25
Variable overhead cost	5.60	5.75
Variable G, S, & A	15.00	14.90

Actual and budgeted fixed costs are shown in Exhibit 15.3.

Exhibit 15.3 shows Melrose's 2011 flexible budget, actual results, and flexible budget variances. The flexible budget is the same one compared to the static budget in Exhibit 15.2. Recall the flexible budget amounts come from multiplying the standard per-unit amounts by the actual volume of production. For example, the sales revenue in the flexible budget comes from multiplying the standard sales price by the actual volume ($80 × 19,000). The variable costs are similarly computed. The *actual results* are calculated by multiplying the actual per-unit sales price and cost figures from the preceding table by the actual volume of activity. For example, the sales revenue in the Actual Results column comes from multiplying the actual sales price by the actual volume ($78 × 19,000 = $1,482,000). The actual cost figures are similarly computed. The differences between the flexible budget figures and the actual results are the **flexible budget variances.**

EXHIBIT 15.3

Flexible Budget Variances for Melrose Manufacturing Company

	Flexible Budget	Actual Results	Flexible Budget Variances	
Number of units	19,000	19,000	0	
Sales revenue	$1,520,000	$1,482,000	$38,000	Unfavorable
Variable manufacturing costs				
Materials	228,000	223,820	4,180	Favorable
Labor	319,200	327,750	8,550	Unfavorable
Overhead	106,400	109,250	2,850	Unfavorable
Variable G, S, & A	285,000	283,100	1,900	Favorable
Contribution margin	581,400	538,080	43,320	Unfavorable
Fixed costs				
Manufacturing overhead	201,600	210,000	8,400*	Unfavorable
G, S, & A	90,000	85,000	5,000*	Favorable
Net income	$ 289,800	$ 243,080	$46,720	Unfavorable

*Since fixed costs are the same in the static and flexible budgets, the fixed cost flexible budget variances are the same as the spending variances.

Calculating the Sales Price Variance

Because both the flexible budget and actual results are based on the actual volume of activity, the flexible budget variance is attributable to sales price, not sales volume. In this case, the actual sales price of $78 per unit is less than the standard price of $80 per unit. Because Melrose sold its product for less than the standard sales price, the **sales price variance** is *unfavorable.* Even though the price variance is unfavorable, however, sales volume was 1,000 units more than expected. It is possible the marketing manager generated the additional volume by reducing the sales price. Whether the combination of lower sales price and higher sales volume is favorable or unfavorable depends on the amount of the unfavorable sales price variance versus the amount of the favorable sales volume variance. The *total* sales variance (price and volume) follows.

Actual sales (19,000 units × $78 per unit)	$1,482,000	
Expected sales (18,000 units × $80 per unit)	1,440,000	
Total sales variance	$ 42,000	Favorable

Alternatively,

Activity variance (sales volume)	$ 80,000	Favorable
Sales price variance	(38,000)	Unfavorable
Total sales variance	$ 42,000	Favorable

This analysis indicates that reducing the sales price had a favorable impact on *total* contribution margin. Use caution when interpreting variances as good or bad; in this instance, the unfavorable sales price variance was more than offset by the favorable sales volume variance. All unfavorable variances are not bad; all favorable variances are not good. Variances signal the need to investigate.

CHECK YOURSELF 15.2

Scott Company's master budget called for a planned sales volume of 30,000 units. Budgeted direct materials cost was $4 per unit. Scott actually produced and sold 32,000 units with an actual materials cost of $3.90 per unit. Determine the volume variance for materials cost and identify the organizational unit most likely responsible for this variance. Determine the flexible budget variance for materials cost and identify the organizational unit most likely responsible for this variance.

Answer

Planned Volume	Actual Volume	Actual Volume
30,000	32,000	32,000
×	×	×
Standard Cost	Standard Cost	Actual Cost
$4.00	$4.00	$3.90
$120,000	$128,000	$124,800
	Volume Variance for Materials Cost	Flexible Budget Variance for Materials Cost
	$8,000 Unfavorable	$3,200 Favorable

The materials volume variance is unfavorable because the materials cost ($128,000) is higher than was expected ($120,000). However, this could actually be positive because higher volume was probably caused by increasing sales. Further analysis would be necessary to determine whether the overall effect on the company's profitability was positive or negative. The marketing department is most likely to be responsible for the volume variance.

The flexible budget materials cost variance is favorable because the cost of materials was less than expected at the actual volume of activity. Either the production department (used less than the expected amount of materials) or the purchasing department (obtained materials at a favorable price) is most likely to be responsible for this variance.

The Human Element Associated with Flexible Budget Variances

The flexible budget cost variances offer insight into management efficiency. For example, Melrose Manufacturing Company's favorable materials variance could mean purchasing agents were shrewd in negotiating price concessions, discounts, or delivery terms and therefore reduced the price the company paid for materials. Similarly, production employees may have used materials efficiently, using less than expected. The unfavorable labor variance could mean managers failed to control employee wages or motivate employees to work hard. As with sales variances, cost variances require careful analysis. A favorable variance may, in fact, mask unfavorable conditions. For example, the favorable materials variance might have been caused by paying low prices for

inferior goods. Using substandard materials could have required additional labor in the production process, which would explain the unfavorable labor variance. Again, we caution that variances, whether favorable or unfavorable, alert management to investigate further.

Need for Standards

As the previous discussion suggests, standards are the building blocks for preparing the static and flexible budgets. Standard costs help managers plan and also establish benchmarks against which actual performance can be judged. Highlighting differences between standard (expected) and actual performance focuses management attention on the areas of greatest need. Because management talent is a valuable and expensive resource, businesses cannot afford to have managers spend large amounts of time on operations that are functioning normally. Instead, managers should concentrate on areas not performing as expected. In other words, management should attend to the exceptions; this management philosophy is known as **management by exception.**

Standard setting fosters using the management by exception principle. By reviewing performance reports that show differences between actual and standard costs, management can focus its attention on the items that show significant variances. Areas with only minor variances need little or no review.

MANAGERIAL PERFORMANCE MEASUREMENT

As previously discussed, 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 (variance analysis and contribution margin format income reporting) used for cost and profit centers have been discussed in this and previous chapters. The remainder of this chapter discusses performance measures for investment centers.

RETURN ON INVESTMENT

LO 6

Evaluate investment opportunities using the return on investment technique.

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. Companies often 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 furniture plant and realizes a large gain on the sale, including the gain in the numerator of the ROI formula would distort the result. Because 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.

CHECK YOURSELF 15.3

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

$$\text{ROI} = \text{Operating income} \div \text{Operating assets} = \$1{,}512{,}000 \div \$12{,}600{,}000 = 12\%$$

District 2

$$\text{ROI} = \text{Operating income} \div \text{Operating assets} = \$1{,}988{,}000 \div \$14{,}200{,}000 = 14\%$$

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.

Factors Affecting 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.

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

Dividing the ROI formula into a margin and a turnover computation encourages managers to examine the benefits of controlling assets as well as expenses.

Because ROI blends many aspects of managerial performance into a single ratio that enables comparisons between companies, comparisons between investment centers within companies, and comparisons between different investment opportunities within an investment center, ROI has gained widespread acceptance as a performance measure.

CHECK YOURSELF 15.4

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 the residual income technique.

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

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.

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 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

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.

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.

LMD's Residual income = ($40,000 × .19) − ($40,000 × .18) = $400

FMD's Residual income = ($10,000 × .19) − ($10,000 × .18) = $100

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 15.5.

CHECK YOURSELF 15.5

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.

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

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 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 in this chapter. You will see how managers select investment opportunities that will affect their future ROIs. You will learn to apply present value techniques 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.

A step-by-step audio-narrated series of slides is provided on the text website at www.mhhe.com/edmondssurvey3e.

SELF-STUDY REVIEW PROBLEM 1

Bugout Pesticides Inc. established the following standard price and costs for a termite control product that it sells to exterminators.

Variable price and cost data (per unit)	Standard	Actual
Sales price	$52.00	$49.00
Materials cost	10.00	10.66
Labor cost	12.00	11.90
Overhead cost	7.00	7.05
General, selling, and administrative (G, S, & A) cost	8.00	7.92
Expected fixed costs (in total)		
Manufacturing	$150,000	$140,000
General, selling, and administrative	60,000	64,000

The 2011 master budget was established at an expected volume of 25,000 units. Actual production and sales volume for the year was 26,000 units.

Required

a. Prepare the pro forma income statement for Bugout's 2011 master budget.

b. Prepare a flexible budget income statement at the actual volume.

c. Determine the sales activity (volume) variances and indicate whether they are favorable or unfavorable. Comment on how Bugout would use the variances to evaluate performance.

d. Determine the flexible budget variances and indicate whether they are favorable or unfavorable.

e. Identify the two variances Bugout is most likely to analyze further. Explain why you chose these two variances. Who is normally responsible for the variances you chose to investigate?

Solution to Requirements a, b, and c

Number of units		25,000	26,000	
	Per Unit Standards	Master Budget	Flexible Budget	Volume Variances
Sales revenue	$52	$1,300,000	$1,352,000	$52,000 F
Variable manufacturing costs				
Materials	10	(250,000)	(260,000)	10,000 U
Labor	12	(300,000)	(312,000)	12,000 U
Overhead	7	(175,000)	(182,000)	7,000 U
Variable G, S, & A	8	(200,000)	(208,000)	8,000 U
Contribution margin		375,000	390,000	15,000 F
Fixed costs				
Manufacturing		(150,000)	(150,000)	0
G, S, & A		(60,000)	(60,000)	0
Net income		$ 165,000	$ 180,000	$15,000 F

The sales activity variances are useful in determining how changes in sales volume affect revenues and costs. Because the flexible budget is based on standard prices and costs, the variances do not provide insight into differences between standard prices and costs versus actual prices and costs.

Solution to Requirement d

Number of units		26,000	26,000	
	Actual Unit Price/Cost	Flexible Budget*	Actual Results	Flexible Budget Variances
Sales revenue	$49.00	$1,352,000	$1,274,000	$78,000 U
Variable manufacturing costs				
Materials	10.66	(260,000)	(277,160)	17,160 U
Labor	11.90	(312,000)	(309,400)	2,600 F
Overhead	7.05	(182,000)	(183,300)	1,300 U
Variable G, S, & A	7.92	(208,000)	(205,920)	2,080 F
Contribution margin		390,000	298,220	91,780 U
Fixed costs				
Manufacturing		(150,000)	(140,000)	10,000 F
G, S, & A		(60,000)	(64,000)	4,000 U
Net income		$ 180,000	$ 94,220	$85,780 U

*The price and cost data for the flexible budget come from the previous table.

Solution to Requirement e

The management by exception doctrine focuses attention on the sales price variance and the materials variance. The two variances are material in size and are generally under the control of management. Upper-level marketing managers are responsible for the sales price variance. These managers are normally responsible for establishing the sales price. In this case, the actual sales price is less than the planned sales price, resulting in an unfavorable flexible budget variance. Mid-level production supervisors and purchasing agents are normally responsible for the materials cost variance. This variance could have been caused by waste or by paying more for materials than the standard price.

A step-by-step audio-narrated series of slides is provided on the text website at www.mhhe.com/edmondssurvey3e

SELF-STUDY REVIEW PROBLEM 2

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 percent. 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
Nonoperating 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
Nonoperating 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

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

Because 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 545
Controllability concept 532
Cost center 532
Decentralization 532
Favorable variance 535
Fixed cost volume variance 537
Flexible budget 533
Flexible budget variance 538
Investment center 532
Making the numbers 536
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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. What is a responsibility center?
3. What are the three types of responsibility centers? Explain how each differs from the others.
4. What is the difference between a static budget and a flexible budget? When is each used?
5. When the operating costs for Bill Smith's production department were released, he was sure that he would be getting a raise. His costs were $20,000 less than the planned cost in the master budget. His supervisor informed him that the results look good but that a more in-depth analysis is necessary before raises can be assigned. What other considerations could Mr. Smith's supervisor be interested in before she rates his performance?
6. When are sales and cost variances favorable and unfavorable?
7. Joan Mason, the marketing manager for a large manufacturing company, believes her unfavorable sales volume variance is the responsibility of the production department. What production circumstances that she does not control could have been responsible for her poor performance?
8. When would variable cost volume variances be expected to be unfavorable? How should unfavorable variable cost volume variances be interpreted?
9. What factors could lead to an increase in sales revenues that would not merit congratulations to the marketing manager?
10. With respect to fixed costs, what are the consequences of the actual volume of activity exceeding the planned volume?
11. How are flexible budget variances determined? What causes these variances?
12. Minnie Divers, the manager of the marketing department for one of the industry's leading retail businesses, has been notified by the accounting department that her department experienced an unfavorable sales volume variance in the preceding period but a favorable sales price variance. Based on these contradictory results, how would you interpret her overall performance as suggested by her variances?
13. How do variance reports promote the management by exception doctrine?
14. 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.
15. What two factors affect the computation of return on investment?
16. What three ways can a manager increase the return on investment?
17. How can a residual income approach to performance evaluation reduce the likelihood of suboptimization?
18. Is it true that the manager with the highest residual income is always the best performer?

MULTIPLE-CHOICE QUESTIONS

Multiple-choice questions are provided on the text website at www.mhhe.com/edmondssurvey3e

EXERCISES

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

LO 3

Exercise 15-1 *Classifying variances as favorable or unfavorable*

Required

Indicate whether each of the following variances is favorable or unfavorable. The first one has been done as an example.

Item to Classify	Standard	Actual	Type of Variance
Labor cost	$10.00 per hour	$9.60 per hour	Favorable
Labor usage	61,000 hours	61,800 hours	
Fixed cost spending	$400,000	$390,000	
Fixed cost per unit (volume)	$3.20 per unit	$3.16 per unit	
Sales volume	40,000 units	42,000 units	
Sales price	$3.60 per unit	$3.63 per unit	
Materials cost	$2.90 per pound	$3.00 per pound	
Materials usage	91,000 pounds	90,000 pounds	

Exercise 15-2 *Determining amount and type (favorable vs. unfavorable) of variance* LO 3

Required

Compute variances for the following items and indicate whether each variance is favorable (F) or unfavorable (U).

Item	Budget	Actual	Variance	F or U
Sales price	$650	$525		
Sales revenue	$580,000	$600,000		
Cost of goods sold	$385,000	$360,000		
Material purchases at 5,000 pounds	$275,000	$280,000		
Materials usage	$180,000	$178,000		
Production volume	950 units	900 units		
Wages at 4,000 hours	$60,000	$58,700		
Labor usage at $16 per hour	$96,000	$97,000		
Research and development expense	$22,000	$25,000		
Selling and administrative expenses	$49,000	$40,000		

Exercise 15-3 *Preparing master and flexible budgets* LO 2

Sexton Manufacturing Company established the following standard price and cost data.

Sales price	$8.00 per unit
Variable manufacturing cost	4.00 per unit
Fixed manufacturing costs	3,000 total
Fixed selling and administrative costs	1,000 total

Sexton planned to produce and sell 2,000 units. Actual production and sales amounted to 2,200 units.

Required

a. Prepare the pro forma income statement in contribution format that would appear in a master budget.

b. Prepare the pro forma income statement in contribution format that would appear in a flexible budget.

Exercise 15-4 *Determining sales and variable cost volume variances* LO 4

Required

Use the information provided in Exercise 15-3.

a. Determine the sales and variable cost volume variances.

b. Classify the variances as favorable (F) or unfavorable (U).

c. Comment on the usefulness of the variances with respect to performance evaluation and identify the member of the management team most likely to be responsible for these variances.

d. Determine the amount of fixed cost that will appear in the flexible budget.

e. Determine the fixed cost per unit based on planned activity and the fixed cost per unit based on actual activity. Assuming Sexton uses information in the master budget to price the company's product, comment on how the volume variance could affect the company's profitability.

LO 5

Exercise 15-5 *Determining flexible budget variances*

Use the standard price and cost data provided in Exercise 15-3. Assume that the actual sales price is $7.65 per unit and that the actual variable cost is $4.25 per unit. The actual fixed manufacturing cost is $2,850, and the actual selling and administrative expenses are $1,025.

Required

a. Determine the flexible budget variances.

b. Classify the variances as favorable (F) or unfavorable (U).

c. Provide another name for the fixed cost flexible budget variance.

d. Comment on the usefulness of the variances with respect to performance evaluation and identify the member(s) of the management team who is (are) most likely to be responsible for these variances.

LO 2

Exercise 15-6 *Using a flexible budget to accommodate market uncertainty*

According to its original plan, Darey Consulting Services Company would charge its customers for service at $125 per hour in 2011. The company president expects consulting services provided to customers to reach 45,000 hours at that rate. The marketing manager, however, argues that actual results may range from 40,000 hours to 50,000 hours because of market uncertainty. Darey's standard variable cost is $48 per hour, and its standard fixed costs are $1,500,000.

Required

Develop flexible budgets based on the assumptions of service levels at 40,000 hours, 45,000 hours, and 50,000 hours.

LO 2

Exercise 15-7 *Evaluating a decision to increase sales volume by lowering sales price*

Ender Educational Services had budgeted its training service charge at $75 per hour. The company planned to provide 30,000 hours of training services during 2012. By reducing the service charge to $60 per hour, the company was able to increase the actual number of hours to 31,500.

Required

a. Determine the sales volume variance, and indicate whether it is favorable (F) or unfavorable (U).

b. Determine the flexible budget variance, and indicate whether it is favorable (F) or unfavorable (U).

c. Did reducing the price of training services increase profitability? Explain.

LO 3

Exercise 15-8 *Responsibility for the fixed cost volume variance*

Ragan Company expected to sell 400,000 of its pagers during 2011. It set the standard sales price for the pager at $30 each. During June, it became obvious that the company would be unable to attain the expected volume of sales. Ragan's chief competitor, Selma, Inc., had lowered prices and was pulling market share from Ragan. To be competitive, Ragan matched Selma's price, lowering its sales price to $28 per pager. Selma responded by lowering its price even further to $24 per pager. In an emergency meeting of key personnel, Ragan's accountant, Suzy Kennedy, stated, "Our cost structure simply won't support a sales price in the $24 range." The production manager, Larry Jones, said, "I don't understand why I'm here. The only unfavorable variance on my report is a fixed cost volume variance and that one is not my fault. We can't be making the product if the marketing department isn't selling it."

Required

a. Describe a scenario in which the production manager is responsible for the fixed cost volume variance.

b. Describe a scenario in which the marketing manager is responsible for the fixed cost volume variance.

c. Explain how a decline in sales volume would affect Ragan's ability to lower its sales price.

Exercise 15-9 *Income statement for internal use* LO 2

Ladmilla Company has provided the following 2011 data.

Budget	
Sales	$500,000
Variable product costs	204,000
Variable selling expenses	50,000
Other variable expenses	3,600
Fixed product costs	16,600
Fixed selling expenses	24,300
Other fixed expenses	2,200
Interest expense	800
Variances	
Sales	8,600 U
Variable product costs	4,000 F
Variable selling expenses	2,500 U
Other variable expenses	1,200 U
Fixed product costs	220 F
Fixed selling expenses	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 these as favorable (F) or unfavorable (U).

Exercise 15-10 *Evaluating a cost center including flexible budgeting concepts* LO 5

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
	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 15-11 *Evaluating a profit center* LO 6, 7

Pamila Smith, the president of Smith Toys Corporation, is trying to determine this year's pay raises for the store managers. Smith 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 Smith 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. Smith 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. Smith about the best performance measure.

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

LO 6

Exercise 15-12 *Return on investment*

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

Required

Compute the return on investment.

LO 6

Exercise 15-13 *Return on investment*

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?

LO 7

Exercise 15-14 *Residual income*

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.

LO 7

Exercise 15-15 *Residual income*

Claire's Cough Drops operates two divisions. The following information pertains to each division for 2012.

	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 6, 7

Exercise 15-16 *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	?
Margin	0.13
Desired rate of return	18%

Exercise 15-17 *Comparing return on investment with residual income* LO 6, 7

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.

PROBLEMS

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

Problem 15-18 *Determining sales and variable cost volume variances* LO 4

Todhunter Publications established the following standard price and costs for a hardcover picture book that the company produces.

CHECK FIGURES
a. NI = $81,000
b. NI at 29,000 units: $72,000

Standard price and variable costs:	
Sales price	$36.00
Materials	9.00
Labor	4.50
Overhead	6.30
General, selling, and administrative	7.20
Planned fixed costs:	
Manufacturing	$135,000
General, selling, and administrative	54,000

Todhunter planned to make and sell 30,000 copies of the book.

Required

a. Prepare the pro forma income statement that would appear in the master budget.
b. Prepare flexible budget income statements, assuming volumes of 29,000 and 31,000 units.
c. Determine the sales and variable cost volume variances, assuming volume is actually 31,000 units.
d. Indicate whether the variances are favorable (F) or unfavorable (U).
e. Comment on how Todhunter could use the variances to evaluate performance.

Problem 15-19 *Determining and interpreting flexible budget variances* LO 5

Use the standard price and cost data supplied in Problem 15-18. Assume that Todhunter actually produced and sold 31,000 books. The actual sales price and costs incurred follow.

CHECK FIGURE
Flexible budget variance of NI: $20,450 U

Actual price and variable costs:	
Sales price	$35.00
Materials	9.20
Labor	4.40
Overhead	6.35
General, selling, and administrative	7.00
Actual fixed costs:	
Manufacturing	$120,000
General, selling, and administrative	60,000

Required

a. Determine the flexible budget variances.

b. Indicate whether each variance is favorable (F) or unfavorable (U).

c. Identify the management position responsible for each variance. Explain what could have caused the variance.

LO 5

eXcel

CHECK FIGURES
a. NI = $180,000
c. NI = $162,500

Problem 15-20 *Flexible budget planning*

Luke Chou, the president of Digitech Computer Services, needs your help. He wonders about the potential effects on the firm's net income if he changes the service rate that the firm charges its customers. The following basic data pertain to fiscal year 2012.

Standard rate and variable costs:	
Service rate per hour	$80.00
Labor	40.00
Overhead	7.20
General, selling, and administrative	4.30
Expected fixed costs:	
Facility repair	$525,000.00
General, selling, and administrative	150,000.00

Required

a. Prepare the pro forma income statement that would appear in the master budget if the firm expects to provide 30,000 hours of services in 2012.

b. A marketing consultant suggests to Mr. Chou that the service rate may affect the number of service hours that the firm can achieve. According to the consultant's analysis, if Digitech charges customers $75 per hour, the firm can achieve 38,000 hours of services. Prepare a flexible budget using the consultant's assumption.

c. The same consultant also suggests that if the firm raises its rate to $85 per hour, the number of service hours will decline to 25,000. Prepare a flexible budget using the new assumption.

d. Evaluate the three possible outcomes you determined in Requirements *a*, *b*, and *c* and recommend a pricing strategy.

LO 6, 7

Problem 15-21 *Different types of responsibility centers*

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 15-22 *Comparing return on investment and residual income*

LO 6, 7

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

CHECK FIGURE
c. 21.32%

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 income	
Gain on 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
Non-operating 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. Should operating income or net income be used to determine the rate of return (ROI) for the Huber investment center? Explain your answer.

b. Should operating assets or total assets be used to determine the ROI for the Huber investment center? 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 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 6

eXcel

CHECK FIGURES

c. 15%

d. (3) 18.75%

Problem 15-23 *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 6, 7

CHECK FIGURES

b. The ROI would decline to 19.60%.

c. RI would increase by $60,000.

Problem 15-24 *Comparing return on investment and residual income*

The manager of the Cohen Division of Leland Manufacturing Corporation is currently producing a 20 percent return on invested capital. Leland's desired rate of return is 16 percent. The Cohen Division has $12,000,000 of capital invested in operating assets and access to additional funds as needed. The manager is considering a new investment in operating assets that will require a $3,000,000 capital commitment and promises an 18 percent return.

Required

a. Would it be advantageous for Leland Manufacturing Corporation if the Cohen Division makes the investment under consideration?

b. What effect would the proposed investment have on the Cohen Division's return on investment? Show computations.

c. What effect would the proposed investment have on the Cohen Division's residual income? Show computations.

d. Would return on investment or residual income be the better performance measure for the Cohen Division's manager? Explain.

ANALYZE, THINK, COMMUNICATE

ATC 15-1 Business Applications Case *Static versus flexible budget variances*

Dan Ludwig is the manufacturing production supervisor for Atlantic Lighting Systems. Trying to explain why he did not get the year-end bonus that he had expected, he told his wife, "This is the dumbest place I ever worked. Last year the company set up this budget assuming it would sell 150,000 units. Well, it sold only 140,000. The company lost money and gave me a bonus for not using as much materials and labor as was called for in the budget. This year, the company has the same 150,000 units goal and it sells 160,000. The company's making all kinds of money. You'd think I'd get this big fat bonus. Instead, management tells me I used more materials and labor than was budgeted. They said the company would have made a lot more money if I'd stayed within my budget. I guess I gotta wait for another bad year before I get a bonus. Like I said, this is the dumbest place I ever worked."

Atlantic Lighting Systems's master budget and the actual results for the most recent year of operating activity follow.

	Master Budget	Actual Results	Variances	F or U
Number of units	150,000	160,000	10,000	
Sales revenue	$33,000,000	$35,520,000	$2,520,000	F
Variable manufacturing costs				
Materials	(4,800,000)	(5,300,000)	(500,000)	U
Labor	(4,200,000)	(4,400,000)	(200,000)	U
Overhead	(2,100,000)	(2,290,000)	(190,000)	U
Variable selling, general, and admin. costs	(5,250,000)	(5,450,000)	(200,000)	U
Contribution margin	16,650,000	18,080,000	1,430,000	F
Fixed costs				
Manufacturing overhead	(7,830,000)	(7,751,000)	79,000	F
Sellings, general, and admin. costs	(6,980,000)	(7,015,000)	(35,000)	U
Net income	$ 1,840,000	$ 3,314,000	$1,474,000	F

Required

a. Did Atlantic increase unit sales by cutting prices or by using some other strategy?

b. Is Mr. Ludwig correct in his conclusion that something is wrong with the company's performance evaluation process? If so, what do you suggest be done to improve the system?

c. Prepare a flexible budget and recompute the budget variances.

d. Explain what might have caused the fixed costs to be different from the amount budgeted.

e. Assume that the company's material price variance was favorable and its material usage variance was unfavorable. Explain why Mr. Ludwig may not be responsible for these variances. Now, explain why he may have been responsible for the material usage variance.

f. Assume the labor price variance is unfavorable. Was the labor usage variance favorable or unfavorable?

g. Is the fixed cost volume variance favorable or unfavorable? Explain the effect of this variance on the cost of each unit produced.

ATC 15-2 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 15-3 Research Assignment *Using real world data from Papa John's*

Obtain the 2004, 2005, 2006, 2007, and 2008 income statements for Papa John's International, Inc. The 2006–2008 statements are included in Papa John's 2008 annual report and Form 10-Ks. The 2004 and 2005 statements are in its 2005 annual report.

To obtain the Form 10-Ks you can use either the EDGAR system following the instructions in Appendix A, or they can be found under "Investors" link on the company's corporate website; www.papajohns.com. The company's annual reports are also available on its website.

Required

a. Compute the percentage change for each of the following categories of revenues and expenses for 2004 to 2005, 2005 to 2006, and 2006 to 2007:

Domestic revenues:
Company-owned restaurant sales
Domestic company-owned restaurant expenses:
Cost of sales
Salaries and benefits
Advertising and related costs
Occupancy costs
Other operating expenses

Using an Excel spreadsheet will make this task much easier. Once these averages are obtained, (you should have three averages for each of the six revenue and expense items), calculate an average of the changes for each item. The answer for the "Occupancy coats" item is show as an example:

	Percentage Change
2004–2005	1.7%
2005–2006	3.2
2006–2007	17.0
Average of the changes	7.3%

b. Prepare a budgeted income statement for 2008 and compare the budgeted data to the actual results for 2008. To calculate budgeted amounts, multiply the average change in each revenue and expense item, from Requirement *b*, by the dollar amount of the corresponding revenue or expense from 2007. This will represent the budgeted amount for that item for 2008. Don't forget to use decimal data and not percentage data. Subtract the actual 2008 results from the budgeted results. Finally, divide the actual versus budgeted difference by the budgeted amount to determine a percentage variance from the budget. Calculate total for "Total domestic company-owned restaurant expenses" by adding the appropriate items. The answer for the "Occupancy costs" item is show as an example: (Dollar amounts are in thousands.)

	(1) 2007 Actual	(2) Average 3-year Change	(3) (1 × 2) 2008 Budget	(4) 2008 Actual	(5) (3 − 4) Variance	(5 ÷ 3) Percentage Variance from Budget
Occupancy costs	$31,866	1.073	$34,192	$34,973	$(781)	.028 [2.8%]

ATC 15-4 Writing Assignment *Analyzing Segments at Coca-Cola*

The following excerpt is from Coca-Cola Company's 2009 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 2009 and 2008 fiscal years. Dollar amounts are in millions.

	Eurasia & Africa	Europe	Latin America	North America	Pacific
2009 Fiscal Year					
Net operating revenues	$2,197	$3,203	$3,882	$ 8,271	$4,875
Income before taxes	810	2,976	2,039	1,701	1,866
Identifiable operating assets	1,155	3,047	2,480	10,941	1,929
2008 Fiscal Year					
Net operating revenues	$2,327	$5,801	$3,835	$ 8,280	$4,695
Income before taxes	823	3,182	2,098	1,579	1,841
Identifiable operating assets	956	3,012	1,849	10,845	1,444

Required

a. Compute the ROI for each of Coke's geographical segments for each fiscal year.

b. Assuming Coke's management expects a minimum return of 30%, calculate the residual income for each segment for each fiscal year.

c. Assume the management of Coke is considering a major expansion effort for the next five years. Write a brief memo that (1) explains which geographic segment you would recommend that Coke focus its expansion efforts, and (2) why the segment with the highest ROI is not the segment with the highest residual income.

ATC 15-5 Ethics Dilemma *Fudging the standards*

Eric Dawson is a department manager at Lemhi, Inc., a manufacturing company. His department is responsible for assembling various products. Lemhi uses a standard costing system to help manage operations and evaluate its managers. In addition to his salary, Mr. Dawson has the potential to earn a bonus based on how well his department performs, and he, in turn, evaluates the workers in his department based on how well they perform their duties, based on the standard costing system.

Lemhi, Inc., has just received a contract to manufacture a new toy, called LogicBlock, for the Toys for the Imagination Company, and Mr. Dawson's department will be responsible for its assembly. The product designers and engineers at Lemhi believe it should take the workers in Mr. Dawson's department 23 minutes to assemble each toy. However, Mr. Dawson told his workers the standard time allowed to assemble each unit of LogicBlock is 21 minutes.

Required

a. Explain what Mr. Dawson is hoping to achieve by telling workers the time expected to assemble a toy is 21 minutes versus 23 minutes.

b. What do you think the short-term and long-term implications of this strategy are likely to be? Explain.