

Module 24

Segment Reporting, Transfer Pricing, and Balanced Scorecard

Learning Objectives

LO1 Define a strategic business segment, and prepare and use segment reports. (p. 24-3)

LO2 Explain transfer pricing and assess alternative transfer-pricing methods. (p. 24-8)

LO3 Determine and contrast return on investment and residual income. (p. 24-13)

LO4 Describe the balanced scorecard as a comprehensive performance measurement system. (p. 24-21)



On the shores of the Mittelland Canal, in the shadow of Wolfsburg Castle, stands the 73 million square-foot factory of Volkswagen (VW). Along with employing 50,000 workers, VW's presence is felt throughout the region from the Volkswagen Arena to the VW-owned Ritz Carlton to Autostadt, VW's sprawling theme park housing the most popular car museum in the world, the ZeitHaus. But VW's products go beyond its flagship brand to include Audi, Porsche, Lamborghini, Bentley, Bugatti, Ducati, SEAT, Skoda, MAN, Scania, and Volkswagen Commercial Vehicles, encompassing a total of 280 different vehicle models. Likewise, VW's reach extends far beyond Germany. VW also has manufacturing or assembly plants in Mexico, Slovakia, China, India, Indonesia, Russia, Brazil, Argentina, Portugal, Spain, Poland, Czech Republic, Bosnia and Herzegovina, South Africa, and the United States.

Given the company's diversity by product line and geographic region, preparing the VW's financial and operating reports by segment assists VW managers in determining where the company should expand or contract its operations. However, the sheer complexity and volume of the company's business make the allocation of common costs across segments a difficult proposition. If managers' performance evaluations are tied to these segmented results, conflicts will undoubtedly arise regarding which allocated costs are within each manager's control.

One of VW's initiatives to manage the business across product and geographic lines is the introduction of modular tool-kit assemblies. This system allows the company to build all of its vehicles using four basic setups: a different tool kit for small, midsize, sports, or large/SUV vehicles. Doing this allows VW to standardize its engineering platforms and reduce inventory costs by using shared components wherever possible. With standardization comes an increase in transfers of components across product line and geographic divisions. However, what is the correct "price" to charge between internal divisions? The "selling" division would like to maximize its divisional performance by charging the highest price possible on the transfer, while the "buying" division would prefer to minimize its costs by paying the lowest price possible to the selling division. And each country in which VW manufactures and assembles its vehicles resides in a different tax jurisdiction such that the choice of a transfer price has real economic consequences for the overall corporate entity.

Another complicating factor in VW's diversity of operations stems from evaluating the performance of the company's divisions. The company will want to compare its return on investment—that is, the income generated for each dollar of investment—across divisions to determine which managers and markets are delivering the best results. But the age of the capital investments, along with financial accounting rules governing depreciation and research and development costs, can distort these performance metrics. In this module, we will discuss performance measures that overcome the weaknesses of traditional performance ratios by taking into account leverage, taxation, level of investment, and the cost of accessing financial capital to make those investments. Further, we will examine performance evaluation models that are future oriented and emphasize nonfinancial measures such as innovation and learning, internal processes, and customer satisfaction in addition to financial performance.





Road Map

LO	Learning Objective Topics	Page	eLecture	Guided Example	Assignments
24-1	Define a strategic business segment, and prepare and use segment reports. Strategic Business Segment :: Segment Reports :: Segment Margin	24-3	e24-1	Review 24-1	15, 16, 17, 31, 32, 33, 34
24-2	Explain transfer pricing and assess alternative transfer-pricing methods. Management Considerations :: Market Price :: Variable Costs :: Variable Costs Plus Opportunity Costs :: Absorption Cost Plus Markup :: Negotiated Prices :: Dual Prices	24-8	e24-2	Review 24-2	18, 19, 20, 24, 25, 26, 37, 38, 40, 41, 42
24-3	Determine and contrast return on investment and residual income. ROI :: Investment Center Income :: Investment Center Asset Base :: Valuation Issues :: Residual Income :: Economic Value Added	24-13	e24-3	Review 24-3	21, 22, 27, 28, 29, 35, 36, 37
24-4	Describe the balanced scorecard as a comprehensive performance measurement system. Balanced Scorecard Framework :: Balanced Scorecard Strategy	24-21	e24-4	Review 24-4	23, 30, 39

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Module Organization

Segment Reporting, Transfer Pricing, and Balanced Scorecard

Strategic Business Segments and Segment Reporting	Transfer Pricing	Investment Center Evaluation Measures	Balanced Scorecard
<ul style="list-style-type: none"> ■ Multilevel Segment Income Statements ■ Interpreting Segment Reports 	<ul style="list-style-type: none"> ■ Management Considerations ■ Determining Transfer Prices 	<ul style="list-style-type: none"> ■ Return on Investment ■ Investment Center Income ■ Investment Center Asset Base 	<ul style="list-style-type: none"> ■ Balanced Scorecard Framework ■ Balanced Scorecard and Strategy



Learning Objective 1

Module Organization

Segment Reporting, Transfer Pricing, and Balanced Scorecard



Organizations that maintain multiple product lines or that operate in several industries or in multiple markets often adopt a decentralized organization structure in which managers of major business units or strategic segments enjoy a high degree of autonomy. Examples of strategic business segments include the **Porsche division of Volkswagen** and the Asia Pacific Group of **The Coca-Cola Company**. Sometimes companies establish segments within segments such as at Coca-Cola, whose Asia Pacific Group has separate business units for individual countries (Japan, Korea, etc.). In organizations such as Volkswagen and Coca-Cola, upper management typically sets specific performance and profitability objectives for each segment and allows the manager of the segment the decision-making freedom to achieve those objectives.

This module explains the ways that an organization evaluates strategic business segments. It also considers transfer pricing and some of the problems that occur when one segment provides goods or services to another segment in the same organization.

Strategic Business Segments and Segment Reporting



A **strategic business segment** has its own mission and set of goals. Its mission influences the decisions that top managers make in both short-run and long-run situations. The organization structure dictates to a large extent the type of financial segment reporting and other measures used to evaluate the segment and its managers. In decentralized organizations, for example, the reporting units (typically called *divisions*) normally are quasi-independent companies, often having their own computer system, cost accounting system, and administrative and marketing staffs. With this type structure, top management monitors the segments to ensure that these independent units are functioning for the benefit of the entire organization.

Although segment reports are normally produced to coincide with managerial lines of responsibility, some companies also produce segment reports for smaller slices of the business that do not represent separate responsibility centers. These parts of the business are not significant enough to be identified as "strategic" business units as defined, but management could want information about them on a continuing basis.

For example, **AT&T** has several strategic business units, including wireless, wireline, and advertising solutions. Financial reports are prepared for each of these units. Within the wireline segment, AT&T can also prepare segment reports on a more detailed basis to determine the profitability of its smaller segments, such as phone-only and data service customers. Most public companies are required to provide some segment information in their annual reports.

The point is that segment reporting is not constrained by lines of responsibility. A segment report can be prepared for any part of the business for which management believes more detailed information is useful in managing that portion of the business.

Business Insight ■ Strategic Segment Organization

Only three automakers have sold 10 million vehicles in a year. The first two were **General Motors** and **Volkswagen**, and both companies famously struggled after hitting the 10 million mark. **Toyota's** sales have been above 10 million vehicles for two years running, and the firm has had its struggles. Senior executives at Toyota have expressed concern that this scale of production, sales, and distribution is difficult to manage.

In order to remain nimble and competitive, Toyota has reorganized operations, shifting from a geographic organization to one based on product lines. Toyota President Akio Toyoda has said that as companies reach the 10 million milestone, reorganization is inevitable at all levels. "We can't talk about our future without finding new ways to do our job," Toyoda said. Analysts who cover the auto industry feel that this attitude is key to Toyota's ability to adjust more



Business Insight ■ Strategic Segment Organization

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One of the key ways that this new structure can help is by streamlining Toyota's product lines. Previously, Toyota modified the marketing and design of its vehicles to the target geography. The Vitz compact, sold in Japan, has a closely related model, the Yaris, sold only in Europe and the United States, while India has the Etios. What Japanese and American customers recognize as the Prius C is marketed in Europe as the Aqua. This geographical focus served Toyota well as it grew to its current size. Now there are gains to be had by simplifying the product lines, partially due to the size of the company, but also due to the global familiarity with Toyota vehicles. All companies should be prepared to modify internal structures as the firm evolves.

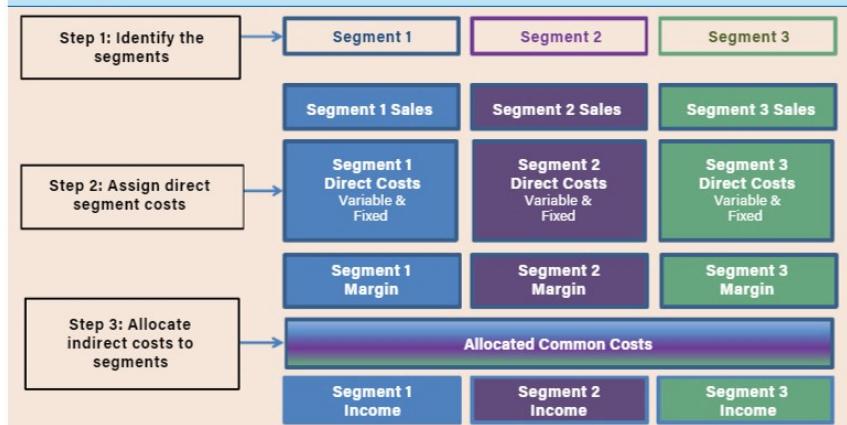
Sources: Naomi Tajitsu, "Toyota Shakes Up Corporate Structure to Focus on Product Lines," *Reuters*, March 2, 2016. Yoko Kubota, "Toyota Plans Organizational Shake-Up," *Wall Street Journal*, February 29, 2016.

Segment reports are income statements for portions or segments of a business. Segment reporting is used primarily for internal purposes, although generally accepted accounting principles also require some disclosure of segment information for public corporations. Even though there are many different types of segment reports, at least three steps are basic to the preparation of all segment reports:

1. Identify the segments.
2. Assign direct costs to segments.
3. Allocate indirect costs to segments.

The format of segment income statements varies depending on the approach adopted by a company for reporting income statements internally. The income statement formats illustrated earlier in this text, including the functional format and the contribution format, can be used for segment reporting. Data availability can, however, dictate the format used. Regardless of the format adopted, it is essential that costs be separable into those directly traceable to the segments and those not directly traceable to segments. See Exhibit 24.1, below, for how the three steps above can be incorporated in the development of segment income.

Exhibit 24.1



Determining the segment reporting structure is often a more difficult decision than choosing the format for the segment income statements. Companies must decide whether to structure segment reporting along the lines of responsibility reporting, and whether segment reports will be prepared only on one level or on several levels.

For example, assume **Cisco** has two market divisions, three products, and two geographic territories. Suppose Cisco's two divisions include the National Division (serving large national accounts) and the Regional Division (serving smaller regional and local accounts). Further assume Cisco's three main product lines are switching, routing, and wireless. The company is organized into two geographic territories, United States and International. If Cisco were using only a single-level segment report-



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For example, assume Cisco has two market divisions, three products, and two geographic territories. Suppose Cisco's two divisions include the National Division (serving large national accounts) and the Regional Division (serving smaller regional and local accounts). Further assume Cisco's three main product lines are switching, routing, and wireless. The company is organized into two geographic territories, United States and International. If Cisco were using only a single-level segment reporting approach for all three groupings, one report would show the total company income statement broken down into the two divisions, a second report would show the total company income statement broken down into the three products, and a third report would show the total company income statement broken down into the two geographic territories.

Multilevel Segment Income Statements

If top management of Cisco wants to know how much a particular product is contributing to the income of one of the two divisions or how much income a particular product in one of its two geographic territories contributes, it is necessary to prepare multilevel segment income statements. Since Cisco sells three products and operates through two divisions in two territories, many combinations of divisions, products, and territories could be used in structuring the company's multilevel segment reporting. The goal is not to slice and dice the revenue and cost data in as many ways as possible but to provide useful and meaningful information to management. Therefore, deciding what type of reporting structure is most useful in managing the company is important.

This decision will be constrained to a great extent by data availability and cost. If there were no data constraints, Cisco could look at the company's net income for every possible combination of division, product, and territory. The more data required to support a reporting system, however, the more costly it is to maintain the system, so management must determine the value and the cost of the additional information and make an appropriate cost-benefit judgment.

Panel A of Exhibit 24.2 illustrates hypothetical multilevel segment reporting for Cisco in which the first level shows the total company income statement segmented into the two market divisions, National Accounts and Regional Accounts. Panel B of Exhibit 24.2 shows a second-level report for Cisco in which the National Division's segment income statement is broken down into its three product lines, switching, routing, and wireless. Panel C then provides a third-level income statement for the National Division's switching product line sales in each of the company's two geographic territories, the U.S. and International territories. The example in Exhibit 24.2 shows only part of the segment reports for Cisco. The complete three-level set of segment reports would also break down the Regional Accounts Division into its product lines and all product lines for both divisions into geographic territories.

In the Cisco example in Exhibit 24.2, the first reporting level is the company's divisions, its second reporting level is product lines, and the third is geographic territories. Another approach could be to structure the segment reports with product lines as the first level, geographic territories as the second level, and divisions as the third level. Still another approach would be to make product lines the first level, divisions the second level, and geographic territories the third level.

Regardless of how many different ways the company segments the income statements, at least one set of segment reports follows the company's responsibility reporting system; therefore, one of the segment reports has the operating divisions as the first level. If each division has a product manager for each product, the division segment reports are broken down by products. Finally, if each product within each division has a territory manager, the product segment reports are broken down by territories.

Interpreting Segment Reports

Exhibit 24.2 reports costs in four categories: variable costs, direct fixed costs, allocated common costs, and unallocated common costs. Variable costs vary in proportion to the level of sales and are subtracted from sales in calculating contribution margin. **Direct segment fixed costs** are nonvariable costs directly traceable to the segments incurred for the specific benefit of the respective segments. **Segment**

Exhibit 24.2 ■ Multilevel Segment Reports

Panel A: First-Level Segment Report of Cisco—For Divisions (in thousands)

	Segments (Divisions)		
	National Accounts	Regional Accounts	Company Total
Sales.....	\$100,000	\$ 200,000	\$300,000
Less variable costs.....	(55,000)	(95,000)	(150,000)



Exhibit 24.2 ■ Multilevel Segment Reports

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	Segments (Divisions)		
	National Accounts	Regional Accounts	Company Total
Sales.....	\$100,000	\$ 200,000	\$300,000
Less variable costs.....	(55,000)	(95,000)	(150,000)
Contribution margin.....	45,000	105,000	150,000
Less direct fixed costs.....	(20,000)	(60,000)	(80,000)
Division margin.....	25,000	45,000	70,000
Less allocated segment costs.....	(10,000)	(25,000)	(35,000)
Division income.....	\$ 15,000	\$ 20,000	35,000
Less unallocated common costs.....			(12,000)
Net income.....			\$ 23,000

Panel B: Second-Level Segment Report of the National Division—For Products (in thousands)

	Segments (Products)			National Accounts Total
	Switching	Routing	Wireless	
Sales.....	\$30,000	\$40,000	\$30,000	\$100,000
Less variable costs.....	(15,000)	(19,000)	(21,000)	(55,000)
Contribution margin.....	15,000	21,000	9,000	45,000
Less direct fixed costs.....	(9,000)	(4,000)	(2,000)	(15,000)
Product margin.....	6,000	17,000	7,000	30,000
Less allocated segment costs.....	(5,000)	(4,000)	(1,000)	(10,000)
Product income.....	\$ 1,000	\$13,000	\$ 6,000	20,000
Less unallocated common costs.....				(5,000)
National Division income.....				\$ 15,000

Panel C: Third-Level Segment Report of the Switching Product Line in the National Division—For Geographic Territories (in thousands)

	Segments (Territories)		Switching Total
	U.S.	International	
Sales.....	\$20,000	\$10,000	\$30,000
Less variable costs.....	(11,000)	(4,000)	(15,000)
Contribution margin.....	9,000	6,000	15,000
Less direct fixed costs.....	(3,000)	(4,000)	(7,000)
Territory margin.....	6,000	2,000	8,000
Less allocated segment costs.....	(2,000)	(3,000)	(5,000)
Territory income.....	\$ 4,000	\$(1,000)	3,000
Less unallocated common costs.....			(2,000)
Switching income.....			\$ 1,000

margin equals the contribution margin minus the direct segment fixed costs. For Cisco, segment margins are referred to as *division margins*, *product margins*, and *territory margins*. Segment margins represent the amount that a segment contributes directly to the company's profitability in the short run.

Common segment costs are incurred for the common benefit of all related segments shown on a segment income statement. In some cases, allocating some common costs is reasonable even though

they cannot be directly traced to the various segments based on benefits received. For example, if segments share common space, allocating all space-related costs to the segments based on building space occupied could be appropriate. If there is no reasonable basis for allocating common costs, they should not be allocated to the segments. In Panel C of Exhibit 24.2, if advertising costs to promote the company's switching products on national television could not be reasonably allocated to the two geographic territories, they would be charged to the switching product line as an unallocated common cost, not to the individual territories.

If some portion of common costs can be reasonably allocated to the segments, those allocated costs are subtracted from the segment margins to determine segment income. Hence, **segment income**



Review 24-1

24-7

Module 24 Segment Reporting, Transfer Pricing, and Balanced Scorecard

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If some portion of common costs can be reasonably allocated to the segments, those allocated costs are subtracted from the segment margins to determine segment income. Hence, **segment income** represents all revenues of the segment minus all costs directly or indirectly charged to it.

To properly interpret segment income, we should ask whether segment income represents the amount by which net income of the company will change if that segment is discontinued. For example, if Cisco discontinues the wireless product line in the National Division, does this mean that Cisco's net income will decrease by \$6 million? Also, does it mean that if the National Division stops selling switching products in the International territory, Cisco's net income will increase by \$1 million?

The answer to these questions depends on whether the costs allocated to the segments are avoidable. **Avoidable common costs** are allocated common costs that eventually can be avoided (that is, can be eliminated) if a segment is discontinued. If all allocated common costs are avoidable, the effect of discontinuing the segment on corporate profitability equals the amount of segment income. In most cases, the short-term impact of discontinuing a segment equals the segment margin because allocated costs are capacity costs that cannot be adjusted in the short run. Over time, the company should be able to adjust capacity and eliminate some, or possibly all, of the allocated common costs or find productive uses for that capacity in other segments of the business. The unallocated common costs cannot be changed readily in the short term or the long term without causing major disruptions to the company and its strategy. Therefore, over the long term, the impact of discontinuing a segment should be, approximately, its segment income.

If Cisco discontinues selling switching products in the International territory (see Exhibit 24.2, Panel C) the short-term effect on the company's profits will probably be a \$2 million reduction of profits, which equals the International territory's margin. The revenues and costs that make up the International territory margin would all be lost if switching sales were discontinued in the International territory, but the \$3 million of common costs allocated to the International territory would continue, at least in the short term. Over the long term, however, after adjusting the capacity for selling this product in the International territory and eliminating the \$3 million of allocated common costs, the effect of discontinuing switching products in the International territory on profits should be an increase of about \$1 million, which is the amount of the segment loss for switching products in the International territory.

To summarize, generally, segment margin is relevant for measuring the short-term effects of decisions to continue or discontinue a segment; however, segment income is relevant for measuring the long-term effects of decisions to continue or discontinue.

Review 24-1 LO1



Refer to the **Cisco** example in Exhibit 24.2, Panel B. The following additional information is provided for the wireless product line in the National Division:

Sales—U.S. territory	\$12,000
Sales—International territory.....	18,000
Direct fixed cost—U.S. territory.....	500
Direct fixed cost—International territory	800
Allocated segment costs—U.S. territory.....	200
Allocated segment costs—International territory	600

Required

- Prepare a geographic territory segment report of the wireless product line in the National division. Assume variable costs are always the same percent of sales for wireless products.
- Explain why the total of the Territory Margins for geographic segments of the wireless product line does not equal the product margin of the wireless product segment in Panel B of Exhibit 24.2.

Solution on p. 24-39.

Transfer Pricing

To determine whether each division is achieving its organizational objectives, managers must be accountable for the goods and services they acquire, both externally and internally. When goods or services are exchanged internally between segments of a decentralized organization, the way that the transferor and the transferee will report the transfer must be determined, either by negotiations between the two segments or by corporate policy. A **transfer price** is the internal value assigned a product or service that one division provides to another. The transfer price is recognized as revenue by the division providing goods





Learning Objective 2

Transfer Pricing

To determine whether each division is achieving its organizational objectives, managers must be accountable for the goods and services they acquire, both externally and internally. When goods or services are exchanged internally between segments of a decentralized organization, the way that the transferor and the transferee will report the transfer must be determined, either by negotiations between the two segments or by corporate policy. A **transfer price** is the internal value assigned a product or service that one division provides to another. The transfer price is recognized as revenue by the division providing goods or services and as expense (or cost) by the division receiving them. Transfer-pricing transactions normally occur between profit or investment centers rather than between cost centers of an organization; however, managers often consider cost allocations between cost centers as a type of transfer price. The focus in this module is on transfers between responsibility centers that are evaluated based on profits.



Management Considerations

The desire of the selling and buying divisions of the same company to maximize their individual performance measures often creates transfer-pricing conflicts within an organization. Acting as independent units, divisions could take actions that are not in the best interest(s) of the organization as a whole. The three examples that follow illustrate the need for organizations to maintain a *corporate* profit-maximizing viewpoint while attempting to allow *divisional* autonomy and responsibility.

Suppose **Sony Corporation** has five divisions, some of which transfer products and product components to other Sony divisions. Suppose the Monitors and Displays (M&D) Division manufactures two products, Yokia Mount and PVMA. It sells Yokia Mount externally for \$50 per unit and transfers PVMA to the Television Division for \$60 per unit. The costs associated with the two products follow:

	Monitors and Displays Division		Product
	Yokia Mount	PVMA	
Variable costs			
Direct materials.....	\$15	\$14	
Direct labor.....	5	10	
Variable manufacturing overhead.....	5	16	
Selling	4	0	
Fixed Costs			
Fixed manufacturing overhead.....	6	15	
Total	\$35	\$55	

An external company has just proposed to supply a PVMA substitute product to the Television Division at a price of \$52. From the company's viewpoint, this is merely a make or buy decision. The relevant costs are the differential outlay costs of the alternative actions. Assuming that the fixed manufacturing costs of the M&D Division are unavoidable, the relevant costs of this proposal from the company's perspective are as follows:

Buy	\$52
Make	
Direct materials.....	\$14
Direct labor.....	10
Variable manufacturing overhead.....	16
Difference	\$12

From the corporate viewpoint, the best decision is for the product to be transferred since the relevant cost is \$40 rather than to buy it from an external source for \$52. The decision for the Television Division

management is basically one of cost minimization: Buy from the source that charges the lowest price. If the M&D Division is not willing to transfer PVMA at a price of \$52 or less, the Television Division management could go to the external supplier to maximize the division's profits. (Although the Television Division's managers are concerned about the cost of PVMA, they are also concerned about the quality of the goods. If the \$52 product does not meet its quality standards, the Television Division could decide to buy from the M&D Division at the higher price. For this discussion, assume that the internal and external products are identical; therefore, acting in its best interest, the Television Division purchases PVMA for \$52 from the external source unless the M&D Division can match the price.)

Prior to Television's receipt of the external offer, the M&D Division had been transferring PVMA



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Prior to Television's receipt of the external offer, the M&D Division had been transferring PVMA to the Television Division's for \$60. The M&D Division must decide whether to reduce the contribution margin on its transfers of PVMA to the Television Division and, therefore, lower divisional profits or to try to find an alternative use for its resources. Of course, corporate management could intervene and require the internal transfer even though it would hurt M&D Division's profits.

As the second example, assume that the M&D Division has the option to sell an equivalent amount of PVMA externally for \$60 per unit if the Television Division discontinues its transfers from the M&D Division. Now the decision for M&D's management is simple: Sell to the buyer willing to pay the most. From the corporate viewpoint, it is best for the M&D Division to sell to the external buyer for \$60 and for Television to purchase from the external provider for \$52.

To examine a slightly different transfer-pricing conflict, assume that the M&D Division can sell all the Yokia that it can produce (it is operating at capacity). Also assume that there is no external market for PVMA, but there is a one-to-one trade-off between the production of Yokia and PVMA, which use equal amounts of the M&D Division's limited capacity.

The corporation still regards this as a make or buy decision, but the costs of producing PVMA have changed. The cost of PVMA now includes an outlay cost and an opportunity cost. The outlay cost of PVMA is its variable cost of \$40 (\$14 + \$10 + \$16), as previously computed. PVMA's opportunity cost is the net benefit foregone if the M&D Division's limited capacity is used to produce PVMA rather than Yokia:

Selling price of Yokia	\$50
Outlay costs of Yokia	
Direct materials.....	\$15
Direct labor.....	5
Variable manufacturing overhead.....	5
Variable selling	4
Opportunity cost of making PVMA.....	(29)
	\$21
	==

Accordingly, the relevant costs in the make or buy decision follow.

Make	
Outlay cost of PVMA.....	\$40
Opportunity cost of PVMA	21
Buy	\$61
	==
	\$52

From the corporate viewpoint, the Television Division should purchase PVMA from the outside supplier for \$52 because in this case it costs \$61 to make the product. If there were no outside suppliers, the corporation's relevant cost of manufacturing PVMA would be \$61. This is another way of saying that the Television Division should not acquire PVMA internally unless its revenues cover all outlay costs (including the \$40 in the M&D Division) and provide a contribution of at least \$21 (\$61 – \$40). From the corporate viewpoint, the relevant costs in make or buy decisions are the external price, the outlay costs to manufacture, and the opportunity cost to manufacture. The opportunity cost is zero if there is excess capacity.

The transfer of goods and services between divisions of a company located in different countries that have unequal tax structures often attracts the attention of the taxing authorities. Companies are sometimes accused of trying to minimize their total tax costs by setting transfer prices that shift profits from the division in the higher-tax-rate country to the division in the lower-tax-rate country. For

example, assume that IBM has a division in Denmark that produces software that it sells to its systems division in the U.S. Denmark's corporate tax rate is about 50 percent; whereas, the U.S. rate is about 35 percent. By setting a transfer price at the lowest possible level, the profits of the Danish division will be less, and those of the American division will be higher, resulting in lower overall taxes for the company. The taxing authorities in the high-tax-rate country always insist that the transfer price for goods and services sold to divisions in other countries be at least as high as fair market value of the goods or services transferred out. The following Business Insight discusses a recent attempt by the IRS to collect taxes of more than \$521 million from **Guidant Corp.** related to improper transfer prices.



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Business Insight ■ Transfer Pricing and the IRS

In late 2010, [Boston Scientific Corp.](#) reported that the IRS had ruled that its [Guidant Corp.](#) division owed \$521.1 million in taxes plus interest as a result of an audit of Guidant's prior year's tax returns. The company indicated that the IRS was "assessing additional taxes related to transfer prices on technology license agreements between some of Guidant's U.S. and foreign businesses."

Boston Scientific asked the U.S. Tax court to throw out the case based on two complaints about the methodology the IRS used. First, Boston Scientific argued that the IRS should have determined the separate taxable income for each Guidant business involved in the complaint. Second, Boston Scientific argued that the IRS failed to make the appropriate adjustments to the transactions in question. In early 2016 the court ruled that the case should go forward.

Sources: "IRS Wins on Question of Aggregation in 'Guidant' Case," *Bloomberg BNA*, March 1, 2016.
"Boston Scientific Owes Half Billion in Taxes, IRS Says; Company to Fight Ruling on Guidant Division," *Boston Globe*, December 22, 2010.

Determining Transfer Prices

As illustrated, the transfer price of goods or services can be subject to much controversy. The most widely used and discussed transfer prices are covered in this section. Although a price must be agreed upon for each item or service transferred between divisions, the selection of the pricing method depends on many factors. The conditions surrounding the transfer determine which of the alternative methods discussed subsequently is selected.

Although no method is likely to be ideal, one must be selected if the profit or investment center concept is used. In considering each method, observe that each transfer results in a revenue entry on the supplier's books and a cost entry on the receiver's books. Transfers can be considered as sales by the supplier and as purchases by the receiver.

Market Price

When there is an existing market with established prices for an intermediate product and the transfer actions of the company will not affect prices, market prices are ideal transfer prices. If divisions are free to buy and sell outside the firm, the use of market prices preserves divisional autonomy and leads divisions to act in a manner that maximizes corporate goal congruence. Unfortunately, not all product transfers have equivalent external markets. Furthermore, the divisions should carefully evaluate whether the market price is competitive or controlled by one or two large companies. When substantial selling expenses are associated with outside sales, many firms specify the transfer price as market price less selling expenses. The internal sale may not require the incurrence of costs to get and fill the order.

To illustrate using the hypothetical Sony example, assume that product Yokia of the M&D Division can be sold competitively at \$50 per unit or transferred to a third division, the Medical Equipment Division, for additional processing. Under most situations, the M&D Division will never sell Yokia for less than \$50, and the Medical Equipment Division will likewise never pay more than \$50 for it. However, if any variable expenses related to marketing and shipping can be eliminated by divisional transfers, these costs are generally subtracted from the competitive market price. In our illustration in which variable selling expenses are \$4 for Yokia, the transfer price could be reduced to \$46 (\$50 – \$4). A price between \$46 and \$50 would probably be better than either extreme price. To the extent that these transfer prices represent a nearly competitive situation, the profitability of each division can then be fairly evaluated.

Variable Costs

If excess capacity exists in the supplying division, establishing a transfer price equal to variable costs leads the purchasing division to act in a manner that is optimal from the corporation's viewpoint. The buying division has the corporation's variable cost as its own variable cost as it enters the external market. Unfortunately, establishing the transfer price at variable cost causes the supplying division to report zero profits or a loss equal to any fixed costs. If excess capacity does not exist, establishing a transfer price at variable cost would not lead to optimal action because the supplying division would have to forego external sales that include a markup for fixed costs and profits. If PVMA could be sold externally for \$60, the M&D Division would not want to transfer PVMA to the Television Division



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Direct materials.....	\$14
Direct labor.....	10
Variable manufacturing overhead	16
Total variable costs.....	\$40

The M&D Division would much rather sell outside the company for \$60, which covers variable costs and provides a profit contribution margin of \$20:

Selling price of PVMA.....	\$60
Variable costs.....	(40)
Contribution margin.....	\$20

Variable Costs Plus Opportunity Costs

From the organization's viewpoint, this is the optimal transfer price. Because all relevant costs are included in the transfer price, the purchasing division is led to act in a manner optimal for the overall company, whether or not excess capacity exists.

With excess capacity in the supplying division, the transfer price is the variable cost per unit. Without excess capacity, the transfer price is the sum of the variable and opportunity costs. Following this rule in the previous example, if the M&D Division had excess capacity, the transfer price of PVMA would be set at PVMA's variable costs of \$40 per unit. At this transfer price, the Television Division would buy PVMA internally, rather than externally at \$52 per unit. If the M&D Division cannot sell PVMA externally but can sell all the Yokia it can produce and is operating at capacity, the transfer price per unit would be set at \$61, the sum of PVMA's variable and opportunity costs (\$40 + \$21). (Refer back two pages.) At this transfer price, the Television Division would buy PVMA externally for \$52. In both situations, the management of the Television Division has acted in accordance with the organization's profit-maximizing goal.

There are two problems with this method. First, when the supplying division has excess capacity, establishing the transfer price at variable cost causes the supplying division to report zero profits or a loss equal to any fixed costs. Second, determining opportunity costs when the supplying division produces several products is difficult. If the problems with the previously mentioned transfer-pricing methods are too great, three other methods can be used: absorption cost plus markup, negotiated prices, and dual prices.

Absorption Cost Plus Markup

According to absorption costing, all variable and fixed manufacturing costs are product costs. Pricing internal transfers at absorption cost eliminates the supplying division's reported loss on each product that can occur using a variable cost transfer price. Absorption cost plus markup provides the supplying division a contribution toward unallocated costs. In "cost-plus" transfer pricing, "cost" should be defined as standard cost rather than as actual cost. This prevents the supplying division from passing on the cost of inefficient operations to other divisions, and it allows the buying division to know its cost in advance of purchase. Even though cost-plus transfer prices may not maximize company profits, they are widely used. Their popularity stems from several factors, including ease of implementation, justifiability, and perceived fairness. Once everyone agrees on absorption cost plus markup pricing rules, internal disputes are minimized.

Negotiated Prices

Negotiated transfer prices are used when the supplying and buying divisions independently agree on a price. As with market-based transfer prices, negotiated transfer prices are believed to preserve divisional autonomy. Negotiated transfer prices can lead to some suboptimal decisions, but this is regarded as a small price to pay for other benefits of decentralization. When they use negotiated transfer prices, some corporations establish arbitration procedures to help settle disputes between divisions. However, the existence of an arbitrator with any real or perceived authority reduces divisional autonomy.

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Negotiated prices should have market prices as their ceiling and variable costs as their floor. Although frequently used when an external market for the product or component exists, the most common use of negotiated prices occurs when no identical-product external market exists. Negotiations could start with a floor price plus add-ons such as overhead and profit markups or with a ceiling price less adjustments for selling and administrative expenses and allowances for quantity discounts. When no identical-product external market exists, the market price for a similar completed product can be used, less the estimated cost of completing the product from the transfer stage to the completed stage.

Dual Prices

Dual prices exist when a company allows a difference in the supplier's and receiver's transfer prices for the same product. This method should minimize internal squabbles of division managers and problems of conflicting divisional and corporate goals. The supplier's transfer price normally approximates market price, which allows the selling division to show a "normal" profit on items that it transfers internally. The receiver's price is usually the internal cost of the product or service, calculated as variable cost plus opportunity cost. This ensures that the buying division will make an internal transfer when it is in the best interest of the company to do so.

In most cases, a market-based transfer price achieves the optimal outcome for both the divisions and the company as a whole. As discussed earlier, an exception occurs when a division is operating below full capacity and has no alternative use for its excess capacity. In this case, it is best for the company to have an internal transfer; therefore, to ensure that the receiving division makes an internal transfer, the company must require the internal transfer as long as its price does not exceed the established market rate. The only time an external price is more attractive when excess capacity exists is when the external price is below the variable cost of the providing internal division, and that scenario is highly unlikely.

A potential transfer-pricing problem exists when divisions exchange goods or services for which no established market exists. For example, suppose that a company is operating its information technology (IT) service department as a profit center that transfers services to other profit center departments using a cost plus transfer price. If the departments using IT services can choose to use those services or to replicate them inside their departments, users might not make a decision that is best for the company. It could be best for the company to have all IT services come from the IT department, but other profit centers could believe that they can provide those services for themselves at lower cost. In this case, the company must decide how important it is to maintain the independence of its profit center. In the interest of maintaining a strong profit center philosophy, top management can decide that it is acceptable to suboptimize by allowing profit centers to provide IT services for themselves.

The ideal transfer-pricing arrangement is seldom the same for both the providing and receiving divisions for every situation. In these cases, what is good for one division is likely not to be good for the other division resulting in no transfer, even though a transfer could achieve corporate goals. These conflicts are sometimes overcome by having a higher-ranking manager impose a transfer price and insist that a transfer be made. Managers in organizations that have a policy of decentralization, however, often regard these orders as undermining their autonomy. Therefore, the imposition of a price could solve the corporate profit optimization problem but create other problems regarding the company's organization strategy. Transfer pricing thus becomes a problem with no ideal solutions.

The previous discussion has focused on the challenges of establishing transfer prices that motivate managers to make decisions that are beneficial to their divisions as well as the overall company. However, research, discussed in the following Research Insight box, concluded that there are often price benefits when dealing with outside vendors, if the company has the option of acquiring the goods or services internally.

Research Insight ■ Transfer Pricing and External Competition

Researchers found that a firm can glean benefits from discussing transfer-pricing problems with external suppliers. Though transfer prices above marginal cost introduce interdivision coordination problems, they also reduce a firm's willingness to pay outside suppliers. Knowing that costly internal transfers will eat into demand, the supplier is more willing to set lower prices. Such supplier discounts can make decentralization worthwhile for the firm. The benefit of decentralization is shown to be robust in both downstream and upstream competition.

Source: "Anil Arya and Brian Mittendorf, "Interacting Supply Chain Distortions: The Pricing of Internal Transfers and External Procurement," *The Accounting Review*, May 2007.



● Learning Objective 3

● Review 24-2

Research Insight ■ Transfer Pricing and External Competition

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Source: "Anil Arya and Brian Mittendorf, "Interacting Supply Chain Distortions: The Pricing of Internal Transfers and External Procurement," *The Accounting Review*, May 2007.

Review 24-2 LO2



University Poster Company has a Publication Division that is currently producing and selling 200,000 posters per year but has a capacity of 300,000 posters. The variable costs of each poster are \$16, and the annual fixed costs are \$1,350,000. The posters sell for \$24 on the open market. The company's Retail Division wants to buy 100,000 posters at \$13.50 each. The Publication Division manager refuses the order because the price is below variable cost. The Retail Division manager argues that the order should be accepted because it will lower the fixed cost per poster from \$6.75 to \$4.50.

Required

- a. Should the Retail Division order be accepted? Why or why not?
- b. From the viewpoints of the Publication Division and the company, should the order be accepted if the manager of the Retail Division intends to sell each print on the outside market for \$44 after incurring additional costs of \$10 per print?
- c. What action should the company take, assuming it believes in divisional autonomy?

Solution on p. 24-40

Investment Center Evaluation Measures



LO3
Determine and contrast return on investment and residual income.

Two of the most common measures of investment center performance, return on investment and residual income, are discussed in the following sections. Several supporting components of these measures that help clarify the applications are also presented. (Earlier in the book, we explained the advantages of separating operating and nonoperating items to compute sales, assets, income, and so forth. We can similarly separate operating and nonoperating items for performance measurement. In this case, all measures would be adjusted to yield operating sales, operating assets, operating income, and so forth. Then, the following analysis would apply to those operating metrics and would reflect the operating performance of each center.)

Return on Investment

Return on investment (ROI) is a measure of the earnings per dollar of investment. This assumes that financing decisions are made at the corporate level rather than the division level. Hence, the corporation's investment in the division equals the division's asset base. The return on investment of an investment center is computed by dividing the income of the center by its asset base (usually total assets):

$$\text{ROI} = \frac{\text{Investment center income}}{\text{Investment center asset base}}$$

ROI can be disaggregated into investment turnover times the return-on-sales ratio:

$$\text{ROI} = \text{Investment turnover} \times \text{Return-on-sales}$$

where

$$\text{Investment turnover} = \frac{\text{Sales}}{\text{Investment center asset base}}$$

and

$$\text{Investment center income}$$



where

$$\text{Investment turnover} = \frac{\text{Sales}}{\text{Investment center asset base}}$$

and

$$\text{Return-on-sales} = \frac{\text{Investment center income}}{\text{Sales}}$$

When investment turnover is multiplied by return on sales, the product is the same as investment center income divided by investment center asset base:

$$\text{ROI} = \frac{\text{Sales}}{\text{Investment center base}} \times \frac{\text{Investment center income}}{\text{Sales}} = \frac{\text{Investment center income}}{\text{Investment center asset base}}$$

Once ROI has been computed, it is compared to some previously identified performance criteria. These include the investment center's previous ROI, overall company ROI, the ROI of similar divisions, or the ROI of nonaffiliated companies that operate in similar markets. The breakdown of ROI into investment turnover and return-on-sales is useful in determining the source of variance in overall performance.

To illustrate the computation and use of ROI, suppose the following information is available concerning the 2017 operations of [Procter & Gamble Co. \(P&G\)](#) (in thousands):

Division	Asset Base	Sales	Divisional Income
Beauty	\$8,000,000	\$12,000,000	\$1,440,000
Healthcare.....	4,000,000	8,000,000	960,000
Grooming	7,500,000	5,000,000	1,650,000
Fabric & Homecare	3,800,000	5,700,000	1,026,000

Using this information and the preceding equations, a set of performance measures are shown in Exhibit 24.3. To illustrate, the Beauty Division earned a return on its investment base of 18 percent ($\$1,440,000 \div \$8,000,000$), consisting of an investment turnover of 1.50 ($\$12,000,000 \div \$8,000,000$) and a return-on-sales of 0.12 ($\$1,440,000 \div \$12,000,000$). Using such an analysis, the company has three measurement criteria with which to evaluate the performance of the Beauty Division: (1) ROI, (2) investment turnover, and (3) return-on-sales.

Exhibit 24.3 Performance Evaluation Data			
PROCTER & GAMBLE CO. Performance Measures For Year Ending June 30, 2017			
Performance Measures			
Investment Turnover × Return-on-Sales = ROI			
Operating unit			
Beauty	1.50	0.12	0.18
Healthcare	2.00	0.12	0.24
Grooming	0.67	0.33	0.22
Fabric & Homecare	1.50	0.18	0.27
Company performance criteria			
Projected minimums.....	1.20	0.15	0.18

For 2017, P&G chose to evaluate its divisions based on company ROI and its interrelated components of investment turnover and return-on-sales. Because each division is different in size, the company evaluation standard is not a simple average of the divisions but is based on desired relationships between assets, sales, and income.

Based on ROI, the Fabric & Homecare Division had the best performance, the Healthcare Division excelled in investment turnover, and the Grooming Division had the highest return-on-sales. From Exhibit 24.3, the Fabric & Homecare Division had the best year because it was the only division that exceeded each of the company's performance criteria. For 2017, each division equaled or exceeded the minimum ROI established by the company even though the component criteria of ROI were not always



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To properly evaluate each division, the company should study the underlying components of ROI. For the Beauty Division, management would want to know why the minimum investment turnover was exceeded while the return on sales minimum was not. The Beauty Division could have incurred unfavorable cost variances by producing inefficiently. As a result of inefficient production, the return-on-sales declined to a point below the minimum desired level. Evaluating a large operating division based on one financial indicator is difficult. Management should select several key indicators of performance when conducting periodic reviews of its operating segments.

A similar analysis of ROI and its components is useful for planning. In developing plans for 2018, management wants to know the possible effect of changes in the major elements of ROI for the Beauty Division. Sensitivity analysis can be used to predict the impact of changes in sales, the investment center asset base, or the investment center income.

Assuming the investment asset base is unchanged, a projected ROI can be determined for the Beauty Division for a sales goal of \$16,000,000 and an income goal of \$1,600,000:

$$\begin{aligned} \text{ROI} &= \frac{\text{Sales}}{\text{Investment center asset base}} \times \frac{\text{Investment center income}}{\text{Sales}} \\ &= \frac{\$16,000,000}{\$8,000,000} \times \frac{\$1,600,000}{\$16,000,000} \\ &= 2.0 \times 0.10 \\ &= 0.20, \text{ or } 20 \text{ percent.} \end{aligned}$$

ROI increased from 18 to 20 percent, even though the return-on-sales decreased from 12 to 10 percent. The change in turnover from 1.5 to 2.0 more than offset the reduced return-on-sales.

Sensitivity analysis can involve changing only one factor or a combination of factors in the ROI model. When more than one factor is changed, it is important to analyze exactly how much change is caused by each factor.

Research Insight ■ Nonprofit Donations Decrease When Donors Believe Managers Are Overpaid

Over 1.4 million nonprofit organizations across the United States received more than \$260 billion in donations during the year 2009. Yet with the weakening economy, contributors to nonprofit organizations are less willing to tolerate inflated salaries of the charity's executives. Specifically, donors decrease their contributions to the organization when the media reports an increase in executive compensation. On average, organizations that draw media coverage over executive compensation increases grow 15 percent less over the two years surrounding the media mention than their peer organizations. However, when this increase is reported on Form 990 for the Internal Revenue Service (IRS), only sophisticated donors reduce their contributions. Small donors may not know where to seek the compensation information out on their own, and larger donors have a greater stake in the stewardship of their donated funds. Among these larger donors, the study reports that contributions decrease by 3 percent for every \$100,000 increase in executive compensation.

Source: Steven Balsam and Erica E. Harris, "The Impact of CEO Compensation on Nonprofit Donations," *The Accounting Review* 89, no. 2 (March 2014): 425–50.

Statistics such as ROI, investment turnover, and return-on-sales mean little by themselves. They take on meaning only when compared with an objective, a trend, another division, a competitor, or an industry average. Many businesses establish minimum ROIs for each of their divisions, expecting them to attain or exceed this minimum return. The salaries, bonuses, and promotions of division managers can be tied directly to their division's ROI. Without other evaluation techniques, managers often strive for ROI maximization, sometimes to the long-run detriment of the entire organization.



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Investment Center Income

Despite the relevance and conceptual simplicity of ROI, a division's ROI cannot be determined until management decides how to measure divisional income and investment. Divisional income equals divisional revenues less divisional operating expenses. Determining divisional revenues is usually a relatively easy task since revenues are typically generated and recorded at the division level, but determining total operating expenses for divisions is more complicated. Because many expenses are incurred at the corporate level for the common benefit of the various operating divisions and to support corporate headquarters operations, the cost assignment issues discussed early in this module affect investment center income.

Direct division expenses are always included in division operating expenses, but there are conflicting viewpoints about how to deal with common corporate expenses. As stated earlier in this module, in corporate annual reports, many companies are required to provide segment revenues and expenses segmented by product lines, geographic territories, customer markets, and so on. Companies also show operating income for their various segments in their annual reports, but they include a category called *corporate* or *unallocated* for company expenses that cannot be reasonably allocated to the various segments. ("Unallocated" typically includes costs for corporate staffs, certain goodwill writeoffs, and nonoperational gains and losses.) For example, the [Ericsson Inc.](#) 2015 annual report includes the following breakdown of its operating income by segments (stated in millions of Swedish kronas):

Networks.....	12,943 SEK
Global services.....	8,215
Support solutions.....	1,504
Modems ¹	7
Unallocated.....	(864)
Total operating income.....	<u><u>21,805 SEK</u></u>

¹ Modems was closed during the second half of 2015

For internal segment reporting, some companies do not allocate corporate costs that cannot be associated closely with individual segments. Other companies insist on allocating all common corporate costs to the operating divisions to emphasize that the company does not earn a profit until revenues have covered all costs. Some top managers believe that since only operating divisions produce revenues, they should also bear all costs, including corporate costs. These managers want to ensure that the sum of the division income for the various segments equals the total income for the company.

Division managers do not control corporate costs; therefore, these costs are seldom relevant in evaluating a division manager's performance. To deal with this conflict, some companies allocate some, or possibly all, common corporate costs in reporting segment operating income, but for ROI calculation purposes exclude allocated corporate costs that are not closely associated with the divisions. These companies include in the ROI calculation costs that represent an identifiable benefit to the divisions but not general corporate costs that provide no identifiable benefits to the divisions. In practice, the treatment of corporate costs for division performance evaluation varies widely.

Investment Center Asset Base

Because the primary purpose for computing ROI is to evaluate the effectiveness of a division's operating management in using the assets entrusted to them, most organizations define *investment* as the average total assets of a division during the evaluation period. For most companies, the *investment base* is defined as each division's operating assets. These normally include those assets held for productive use, such as accounts receivable, inventory, and plant and equipment. Nonproductive assets, such as land for a future plant site, are not included in the investment base of a division but in the investment base for the company.



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General corporate assets allocated to divisions should not be included in their bases. Although the divisions might need additional administrative facilities if they were truly independent, they have no control over the headquarters' facilities. The joint nature and use of corporate facility-level expenses make any allocation arbitrary.

Other Valuation Issues

Once divisional investment and income have been operationally defined and ROI computations have been made, the significance of the resulting ratios can still be questioned. Return on investment can be overstated in terms of constant dollars because inflation as well as arbitrary inventory and depreciation procedures cause an undervaluation of the inventory and fixed assets included in the investment center asset base. Asset measurement is particularly troublesome if inventories are valued at last-in, first-out (LIFO) cost and fixed assets were acquired many years ago. A division manager could hesitate to replace an old, inefficient asset with a new, efficient one because the replacement could lower income and ROI through an increased investment base and increased depreciation.

To improve the comparability between divisions with old and new assets when computing ROI, some firms value assets at original cost rather than at net book value (cost less accumulated depreciation). This procedure does not reflect inflation, however. An old asset that cost \$120,000 ten years ago is still being compared with an asset that costs \$200,000 today. A better solution could be to value old assets at their replacement cost, although replacement costs are often difficult to determine.

Managerial Decision ■ You are the Division Vice President

Division managers in your company are evaluated primarily based on division return on investment, and you recently received financial reports for your division for the most recent period and discovered that the ROI for your division was 14.5%; whereas, the target ROI for your division set by the CFO and the CEO was 15%. What action can you take to try to avoid missing your performance target for the next period? [Answer, p. 24-25]

Residual Income

Residual income is an often-mentioned alternative to ROI for measuring investment center performance. **Residual income** is the excess of investment center income over the minimum rate or dollar of return. The *minimum rate of return* represents the rate that can be earned on alternative investments of similar risks, which is the opportunity cost of the investment. The *minimum dollar return* is computed as a percentage of the investment center's asset base. When residual income is the primary basis of evaluation, the management of each investment center is encouraged to maximize residual income rather than ROI. (We can again measure assets, sales, income, and so forth, as excluding all nonoperating components; similarly, the investment base can be measured as operating assets less operating liabilities).

To illustrate the computation, assume that a company requires a minimum return of 12 percent on each division's investment base. The residual income of a division with an annual net operating income of \$2,000,000 and an investment base of \$15,000,000 is \$200,000 as computed here:

Division income.....	\$2,000,000
Minimum return ($\$15,000,000 \times 0.12$).....	(1,800,000)
Residual income	\$ 200,000

Economic Value Added

A variation of residual income, referred to as **economic value added** or **EVA®**, is also often used as a basis for evaluating investment center performance. (The term EVA is a registered trademark of the financial consulting firm of Stern Stewart and Company.) EVA is equal to income after taxes less the cost of capital employed. The three significant changes from the residual income computation in applying EVA are the use of an organization's weighted average cost of capital as the minimum return, *net assets* as the evaluation base, and after-tax income. **Weighted average cost of capital** is an average of the after-tax cost of all long-term borrowing and the cost of equity¹; ¹ See the glossary for a definition of WACC. To compute the WACC, divide the individual costs of debt and equity by their respective weights and then multiply by the weight of each component.



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Using the preceding situation, assume that the company has a cost of capital of 10 percent, \$1,800,000 in current liabilities, and a 30 percent tax rate. The economic value-added is \$80,000, computed as follows:

Division income after taxes ($\$2,000,000 \times 0.70$).....	\$1,400,000
Cost of capital employed [$(\$15,000,000 - \$1,800,000) \times 0.10$].....	<u>(1,320,000)</u>
Economic value added	<u><u>\$ 80,000</u></u>

Another differentiating characteristic of the EVA model is that it usually corrects for potential distortions in economic net income caused by generally accepted accounting principles (GAAP). In calculating EVA, the user can abandon any accounting principles that are viewed as distorting the measurement of wealth creation. In practice, EVA consultants have identified up to 150 different adjustments to GAAP income and equity that must be made to restore equity and income to their true economic values. Most companies use no more than about five adjustments (such as the capitalization of research and development cost and the elimination of goodwill write-offs).

Proponents of EVA argue that it is the best measure of managerial performance from the standpoint of maximizing the market value added to a firm through managerial decisions. They maintain that **market value added (MVA)**, which is the increase in market value of the firm for the period, is the definitive measure of wealth creation and that MVA is maximized by maximizing EVA. By maximizing the excess of economic net income over the cost of all outside capital invested in the firm, the firm should maximize its MVA in the long run.

One might ask why we should use EVA to estimate managerial contribution to the maximization of MVA, when we could simply measure how much market value has been added to the firm by considering changes in stock prices. In practice this does not work well because of short-run changes in market prices caused by overall market factors, not just firm-specific factors, and the inability of market prices to reflect divisional wealth creation that is not transparent. Also, many firms are not publicly traded, which makes determining market value changes problematic. Finally, companies want to measure managerial performance over specific segments of a firm, as well as the firm as a whole, but market values for individual segments are seldom available.

EVA provides a good operational metric for assessing managers' performance in terms of maximizing MVA over time. It is a model that can be used to guide managerial action. Companies that use EVA for evaluating performance use it in making a broad range of decisions such as evaluating capital expenditure proposals, adding or dropping a product line, or acquiring another company. Only alternatives that provide economic value are accepted. The following Business Insight box discusses how **Whole Foods** uses EVA to guide decisions about store locations.

¹ Weighted average cost of capital computations are covered in introductory corporate finance textbooks.

Business Insight ■ Economic Value Added

One of the major puzzles facing the grocery industry is investing in new stores. Organic grocer **Whole Foods Market** uses economic value added (EVA) to guide its decisions about store locations. Whole Foods analyzes potential sites based on population density, income levels, and education levels. A prospective site is then studied in depth, considering sales projections and estimates of construction and operating costs. Before the company commits capital to a new store, the project must meet an EVA hurdle based on the company's cost of capital. This hurdle is generally positive EVA in under five years.

According to Joel Stern, CEO of **Stern Stewart and Company** (a consulting company) the EVA ethos pervades the entire Whole Foods Organization. Stern says that Whole Foods employees are trained to add value to every op-

**Business Insight ■ Economic Value Added**

One of the major puzzles facing the grocery industry is investing in new stores. Organic grocer **Whole Foods Market** uses economic value added (EVA) to guide its decisions about store locations. Whole Foods analyzes potential sites based on population density, income levels, and education levels. A prospective site is then studied in depth, considering sales projections and estimates of construction and operating costs. Before the company commits capital to a new store, the project must meet an EVA hurdle based on the company's cost of capital. This hurdle is generally positive EVA in under five years.

According to Joel Stern, CEO of **Stern Stewart and Company** (a consulting company) the EVA ethos pervades the entire Whole Foods Organization. Stern says that Whole Foods employees are trained to add value to every customer interaction. The practice is for employees to take customers to the items that they are looking for and to point out relevant specials on the way rather than simply giving directions.

Sources: "SEC Form 10-K, Whole Foods Market, Inc." The Securities and Exchange Commission EDGAR SYSTEM, November 13, 2015, 6. Joel Stern and Joseph Willett, "A Look Back at the Beginnings of EVA and Value-Based Management," *Journal of Applied Corporate Finance* 26, no. 1 (Winter 2014): 39-46.

Which Measure Is Best?

Many executives view residual income or EVA as a better measure of managers' performance than ROI. They believe that residual income and EVA encourages managers to make profitable investments that managers might reject if being measured exclusively by ROI.

To illustrate, assume that three divisions of **Monsanto** have an opportunity to make an investment of \$100,000 that requires \$10,000 of additional current liabilities and that will generate a return of 20 percent. The manager of the Chemical Division is evaluated using ROI, the manager of the Agriculture Division is evaluated using residual income, and the manager of the Nutrition Division is evaluated using economic value added. The current ROI of each division is 24 percent. Each division has a current income of \$120,000, a minimum return of 18 percent on invested capital, and a cost of capital of 14 percent. If each division has a current investment base of \$500,000, current liabilities of \$40,000, and a tax rate of 30 percent, the effect of the proposed investment on each division's performance is as follows:

	Current	+	Proposed	=	Total
Chemical Division					
Investment center income/Asset base	\$120,000		\$ 20,000		\$140,000
	\$500,000		\$100,000		\$600,000
ROI	24%		20%		23.3%
Agriculture Division					
Asset base	\$500,000		\$100,000		\$600,000
Investment center income.....	\$120,000		\$ 20,000		\$140,000
Minimum return (0.18 × base).....	(90,000)		(18,000)		(108,000)
Residual income	\$ 30,000		\$ 2,000		\$ 32,000
Nutrition Division					
Assets	\$500,000		\$100,000		\$600,000
Current liabilities.....	(40,000)		(10,000)		(50,000)
Evaluation base.....	\$460,000		\$ 90,000		\$550,000
Investment center income.....	\$120,000		\$ 20,000		\$140,000
Income taxes (30%).....	(36,000)		(6,000)		(42,000)
Income after taxes	84,000		14,000		98,000
Cost of capital (0.14 × base)	(64,400)		(12,600)		(77,000)
Economic value added	\$ 19,600		\$ 1,400		\$ 21,000

The Chemical Division manager will not want to make the new investment because it reduces the current ROI from 24 percent to 23.3 percent. This is true, even though the company's minimum return is only 18 percent. Not wanting to explain a decline in the division's ROI, the manager will probably reject the opportunity even though it could have benefited the company as a whole.

The Agriculture Division manager will probably be happy to accept the new project because it increases residual income by \$2,000. Any investment that provides a return more than the required minimum of 18 percent will be acceptable to the Agriculture Division manager. Given a profit maximization goal for the organization, the residual income method is preferred over ROI evaluations because it encourages division managers to accept all projects with returns above the 18 percent cutoff. The same is true for the



Review 24-3

The Chemical Division manager will not want to make the new investment because it reduces the current ROI from 24 percent to 23.3 percent. This is true, even though the company's minimum return is only 18 percent. Not wanting to explain a decline in the division's ROI, the manager will probably reject the opportunity even though it could have benefited the company as a whole.

The Agriculture Division manager will probably be happy to accept the new project because it increases residual income by \$2,000. Any investment that provides a return more than the required minimum of 18 percent will be acceptable to the Agriculture Division manager. Given a profit maximization goal for the organization, the residual income method is preferred over ROI evaluations because it encourages division managers to accept all projects with returns above the 18 percent cutoff. The same is true for the Nutrition Division manager, although the EVA increase is not as high as that of the residual income because it has a different base.

The primary disadvantage of the residual income and EVA methods as comparative evaluation tools is that they measure performance in absolute dollars rather than percentages. Although they can be used to compare period-to-period results of the same division or with similar-size divisions, they cannot be used effectively to compare the performance of divisions of substantially different sizes. For example, the residual income of a multimillion dollar sales division should be higher than that of a half-million-dollar sales division. Because most performance evaluations and comparisons are made between units or alternative investments of different sizes, ROI continues to be extensively used. The following Business Insight box discusses the changing role of IT as the need for data management and analysis grows.

Business Insight ■ Measuring the Value of an IT Project

Historically, a company's IT department has been a support department for the core business. According to research by **The Hackett Group**, the modern IT group has the opportunity to redefine its role as the need for data management and analysis grows. The issue facing leaders of IT departments is that traditional metrics for IT departments focus on minimizing costs. To redefine the role of the IT department, managers need to redefine the way department performance is measured. The Hackett Group recommends the use of key performance indicators (KPIs), developed with input from stakeholders across the organization, that focus on the transformative contribution of the IT department. In the past, IT supported the software and hardware that employees used to do their jobs. Now the IT group can support managers with information they can use to implement their strategic decisions.

Source: "IT Strives to Reinvent Itself Despite Budget Restrictions While Delivering Improved Information and Analytics," *The Hackett Group*, April 1, 2014.

LO3 Review 24-3

KBR Inc., a decentralized engineering and construction organization, has three divisions, Engineering, Construction, and Military. Assume corporate management desires a minimum return of 15 percent on its investments and has a 20 percent tax rate. Suppose the divisions' 2017 results follow (in thousands):



Division	Income	Investment
Engineering	\$30,000	\$200,000
Construction.....	50,000	250,000
Military.....	22,000	100,000

The company is planning an expansion project in 2018 that will cost \$50,000,000 and return \$9,000,000 per year.

Required

- a. Compute the ROI for each division for 2017.
- b. Compute the residual income for each division for 2017.
- c. Rank the divisions according to their ROI and residual income.
- d. Assume that other income and investments will remain unchanged. Determine the effect of the project by itself. What is the effect on ROI and residual income, if the new project is added to each division?

Solution on p. 24-40.

Balanced Scorecard



LO4

Describe the balanced scorecard as a comprehensive performance measure-

Although financial measures have been emphasized throughout this text, several sections stress that other measures, specifically qualitative measures, are important in evaluating managerial performance. This section examines one popular method of performance evaluation using *both* financial and non-financial information.

We might ask: why not use just financial measures? First, no single financial measure captures all performance aspects of an organization. More than one measure must be used. Second, financial



● Learning Objective 4

Balanced Scorecard

 **L04**
MBC Describe the balanced scorecard as a comprehensive performance measurement system.

Although financial measures have been emphasized throughout this text, several sections stress that other measures, specifically qualitative measures, are important in evaluating managerial performance. This section examines one popular method of performance evaluation using *both* financial and nonfinancial information.

We might ask: why not use just financial measures? First, no single financial measure captures all performance aspects of an organization. More than one measure must be used. Second, financial measures have reporting time lags that could hinder timely decision making. Third, financial measures might not accurately capture the information needed for current decision making because of the delay that sometimes occurs between making financial investments and receiving their results. For example, building a new nuclear power plant can take several years with the investment in total assets increasing the entire time without generating any revenues.

Balanced Scorecard Framework

Comprehensive performance measurement systems are one suggested solution. The basic premise is to establish a set of diverse key performance indicators to monitor performance. The **balanced scorecard** is a performance measurement system that includes financial and operational measures related to a firm's goals and strategies. The balanced scorecard comprises several categories of measurements, the most common of which include the following:

- Financial
- Customer satisfaction
- Internal processes
- Innovation and learning

A balanced scorecard is usually a set of reports required of all common operating units in an organization. To facilitate the periodic evaluation of performance, a cover sheet (or sheets for a large operation) can be used to summarize the performance of each area using the established criteria for each category.

For example, **Einstein Brothers** might have a balanced scorecard that looks something like the one in Exhibit 24.4. This balanced scorecard uses four categories for evaluation and includes financial and nonfinancial information. Each category being monitored has information from the previous period and the standard related to the category. The report should always include the current period, at least one previous period, and some standard. Each store manager should attach documentation and an appropriate explanation as to the change in the measurements during the reporting period.

Exhibit 24.4 ■ Balanced Scorecard Illustration

	Standard	Prior Period	Current Period
Key financial indicators			
Cash flow	\$ 25,000	\$ 28,000	\$ 21,000
Return on investment (ROI).....	0.18	0.22	0.19
Sales.....	\$4,400,000	\$4,494,000	\$4,342,000
Key customer indicators			
Average customers per hour.....	75	80	71
Number of customer complaints per period	22	21	17
Number of sales returns per period	10	8	5
Key operating indicators			
Bagels sold/produced per day ratio.....	0.96	0.93	0.91
Daily units lost (burned, dropped, etc.)	25	32	34
Employee turnover per period	0.10	0.07	0.00
Key growth and innovation indicators			
New products introduced during period.....	1	1	0
Products discontinued during period.....	1	1	1
Number of sales promotions.....	3	3	2
Special offers, discounts, etc.....	4	5	3

In making assessments with the evaluation categories, it is important to consider both trailing and leading performance measures. *Trailing measures* look backward at historical data while *leading measures* provide some idea of what to expect currently or in the near future. For example, in the financial category, ROI is a trailing indicator while a budget of production units and costs for the next period is a leading indicator. In the customer category, the number of sales invoices per store might tell us whether each store is maintaining its customer base (a trailing indicator) while the number of product complaints per 1000 invoices might be a leading indicator of customer satisfaction, quality control problems, and future sales.

The use of balanced scorecard systems to monitor and assess managerial and organizational



In making assessments with the evaluation categories, it is important to consider both trailing and leading performance measures. *Trailing measures* look backward at historical data while *leading measures* provide some idea of what to expect currently or in the near future. For example, in the financial category, ROI is a trailing indicator while a budget of production units and costs for the next period is a leading indicator. In the customer category, the number of sales invoices per store might tell us whether each store is maintaining its customer base (a trailing indicator) while the number of product complaints per 1000 invoices might be a leading indicator of customer satisfaction, quality control problems, and future sales.

The use of balanced scorecard systems to monitor and assess managerial and organizational performance is increasing worldwide. The following Business Insight discusses some of the complexities involved in the [Department of Education's](#) implementation of the College Scorecard.

Business Insight ■ Understanding Your Strategy: The First Step to a Balanced Scorecard

Since 2013, the [Department of Education](#) has been applying a modified version of the balanced scorecard to universities. The College Scorecard was developed to help prospective students evaluate universities before applying. Like all balanced scorecard approaches, the efficacy of the College Scorecard depends on how well what is measured reflects the underlying economics of the business or organization, which is reflected in both the praise and criticism of the College Scorecard. Proponents of the scorecard point to measurement of alumni debt and salaries as powerful reflections of important economic realities that prospective students should consider. Critics of the College Scorecard note that the data in the Scorecard does not allow students to compare themselves by major. A history major considering two schools can only compare average students at the two schools, not history majors at the two schools. Critics also point to the fact that the scorecard only considers full-time students who start and finish at the same school.

With all balanced scorecard approaches to performance evaluation, two essential considerations underpin success. First, the scorecard must be based on a clear understanding of the business activity. Second, the limitations of what can be measured should be carefully considered. Users of the scorecard approach must be careful to craft measurements that accurately reflect the underlying value creation process.

Sources: Peter McPherson and Andrew Kelly, "The College Scorecard Strikes Out," *Wall Street Journal*, March 16, 2015. Jonathan Rothwell, "Understanding the College Scorecard," *Brookings*, September 28, 2015.

A balanced scorecard gives management a perspective of the organization's performance on a recurring set of criteria. Since each reporting unit knows what reports are expected, no one is surprised by changing monthly requests for data. Because the multiple perspectives provide management a broad analysis of the organization's performance, it allows them to determine how and where the goals and objectives are either being achieved or not achieved.

For most management teams, the balanced scorecard highlights trade-offs between measures. For example, a substantial increase in customer satisfaction can result in a short-run decrease in ROI because the extra effort to please customers is expensive, thereby reducing ROI. A balanced scorecard can be filtered down the organization with successively lower-level operating units having their own scorecards that mimic those of the higher-level units. This provides all levels of management an opportunity to evaluate operations from more than just a financial perspective.

Research Insight ■ A Picture May Be Worth a Higher Stock Price

In his book *The Winter of Our Discontent*, John Steinbeck wrote, "For the most part people are not curious except about themselves." Psychologists define narcissism as a sense of self-importance, uniqueness, entitlement, self-absorption, arrogance, and vanity. However, some of these same traits are correlated with leadership qualities. In a recent study, researchers investigate the link between CEO narcissism and financial performance, specifically, earnings per share (EPS) and stock price.

They measure CEO narcissism by examining the size and composition of the CEO's photograph in the annual report and components of the CEO's compensation package. They find that narcissistic managers are more likely to take actions that increase sales and production levels, such as extending lenient credit terms, offering sales discounts, and overproducing. There is no evidence that these same managers attempt to manage earnings through accrual-related actions.

Source: Kari Joseph Olsen, Kelsey Kay Dworkis, and S. Mark Young, "CEO Narcissism and Accounting: A Picture of Profits," *Journal of Management Accounting Research* 26, no. 2 (Fall 2014): 243-67.

As with all management tools and techniques, the use of the balanced scorecard must be incorporated with the other information sources within the organization. Just as the accounting information system cannot stand alone in managing a business, neither can the balanced scorecard. Some areas could need extensive accounting information in great detail to make the best possible decision while other areas need great detail in production or service integration to be at the right place at the right time. By using a multi-faceted approach to managing, the organization should be able to better establish an operating strategy that coincides with its overall goals and objectives.



As with all management tools and techniques, the use of the balanced scorecard must be incorporated with the other information sources within the organization. Just as the accounting information system cannot stand alone in managing a business, neither can the balanced scorecard. Some areas could need extensive accounting information in great detail to make the best possible decision while other areas need great detail in production or service integration to be at the right place at the right time. By using a multi-faceted approach to managing, the organization should be able to better establish an operating strategy that coincides with its overall goals and objectives.

Balanced Scorecard and Strategy

When a balanced scorecard system is fully utilized to monitor and evaluate an organization's progress, it becomes a system for operationalizing the organization's strategy. Having a goal to maximize shareholder value or generate a certain income does not constitute a strategy. Maximizing shareholder value can be an overarching corporate goal, but it will not likely be realized without a well-developed strategy that identifies and establishes a balanced set of goals on various dimensions of performance.

A balanced scorecard can be the primary vehicle for translating strategy into action and establishing accountability for performance. The balanced scorecard identifies the areas of managerial action that are believed to be the drivers of corporate achievement. If the corporate goal is to increase ROI or residual income, the balanced scorecard should include key performance indicators that drive these measures.

An interesting parallel to the successful management of a company can be drawn by considering the key performance indicators the manager of a professional baseball team uses in setting goals and evaluating progress. The manager of the New York Yankees does not just tell his players and managers at the beginning of the baseball season that the team's goal is to win the World Series or even a certain number of ball games. The win-loss record is only one metric used to set goals and evaluate performance for a baseball team. The manager looks at many different drivers of success related to hitting, pitching, and fielding, including the earned-run averages of the pitchers, the batting and on-base averages of hitters, the number of errors per game by fielders, and the number of bases stolen by base runners. At the end of the season, the manager measures success not just by whether the Yankees won the World Series, but also by the batting average, number of home runs, and number of bases stolen by individual players, and whether or not a team member won a Golden Glove award or the Cy Young award. These are all measures by which to evaluate achievement and strategic accomplishment. By achieving the goals for each of these areas of the game, the win-loss ratio will take care of itself. If the win-loss results are not acceptable, then the manager adjusts his strategic goals with respect to the key performance indicators (or the manager is dismissed).

Like a baseball team, a company can use a balanced scorecard to develop performance metrics for managers from the top of the company to the lowest-level department. The scorecard becomes a vehicle for communicating the factors that are key to the success of managers, factors that upper management will monitor in evaluating the success of lower managers in carrying out the corporate strategy. To make balanced scorecards more user friendly, several companies use performance monitoring **dashboards**, which are computer generated graphics that present scorecard results using graphics, some of which mimic the instrument displays on an automobile dashboard.

The following Business Insight provides an illustration of dashboard graphics.

Business Insight ■ Balanced Scorecard Dashboard

Balanced scorecard dashboards provide information about an organization in an "at-a-glance" format. Many software companies now provide utilities for generating dashboards from SAP, Excel, QuickBooks, and other databases. The following is an example of a dashboard for Sonatica, a fictional company, designed by Dundas Dashboard for assessment of financial performance. The shaded tabs present financial information graphics for Sales and Support. Additional screens would provide performance data on other scorecard dimensions such as internal processes, customers, and innovation and growth.

continued



Review 24-4



Source: <http://www.dashboardinsight.com/dashboards/live-dashboards/dundas-dashboard-v-2-0-demo.aspx>

LO4 Review 24-4

Balanced Scorecard The following alphabetically ordered list of financial and nonfinancial performance metrics is provided for Northeast Inc.



- | | |
|--------------------------------|--------------------------------|
| Average call wait | New product acceptance rate |
| Average customer survey rating | New product revenue |
| Employee turnover ratio | New product ROI |
| Expense as a % of revenue | Net profit |
| Expense variance % | Net profit margin |
| Fulfillment % | Number of complaints |
| Headcount growth | Number of defects reported |
| Industry quality rating | Service error rate |
| Job offer acceptance rate | Time to market on new products |
| Market share | Unique repeat customer count |
| New customer count | Year over year revenue growth |
| New customer sales value | |

Required

- Assign the above metrics to the four balanced scorecard categories of (1) Financial Success, (2) Customer Satisfaction and Brand Improvement, (3) Business Process Improvement, (4) Learning and Growth of Motivated Workforce.
- Comment on the use of balanced scorecard versus a single financial measure such as ROI or EVA.

Solution on p. 24-41.

Guidance Answers

You are the Division Vice President

Pg. 24-17 ROI is primarily a measure of the profitability of a division's assets, which is in turn a measure of how effectively the investment in assets was used to generate sales, and how profitable those sales were. ROI is driven by investment (or asset) turnover (which is division sales divided by assets) and return on sales (which is division net income divided by division sales). Therefore, increasing ROI is similar to a simultaneous balancing act involving controlling sales, expenses, and asset investment. You can increase ROI by increasing sales more than expenses, controlling expenses, or increasing assets.



Guidance Answers

You are the Division Vice President

Pg. 24-17 ROI is primarily a measure of the profitability of a division's assets, which is in turn a measure of how effectively the investment in assets was used to generate sales, and how profitable those sales were. ROI is driven by investment (or asset) turnover (which is division sales divided by assets) and return on sales (which is division net income divided by division sales). Therefore, increasing ROI is similar to a simultaneous balancing act involving controlling sales, expenses, and asset investment. You can increase ROI by increasing sales more than expenses, while holding asset investment constant, or by other combinations of these three variables that ultimately increase ROI. If you adjust one of these variables, at the same time you must keep your eye on the other two variables or you may not achieve your goal of increasing ROI.

Questions

- Q24-1.** What is the relationship between segment reports and product reports?
- Q24-2.** What is a reporting objective? How is it determined?
- Q24-3.** Can a company have more than one type of first-level statement in segment reporting?
- Q24-4.** Explain the relationships between any two levels of statements in segment reporting.
- Q24-5.** Distinguish between direct and indirect segment costs.
- Q24-6.** What types of information are needed before management should decide to drop a segment?
- Q24-7.** In what types of organizations and for what purpose are transfer prices used?
- Q24-8.** What problems arise when transfer pricing is used?
- Q24-9.** When do transfer prices lead to suboptimization? How can suboptimization be minimized? Can it be eliminated? Why or why not?
- Q24-10.** For what purpose do organizations use return on investment? Why is this measure preferred to net income?
- Q24-11.** What advantages do residual income and EVA have over ROI for segment evaluations?
- Q24-12.** Contrast the difference between residual income and EVA.
- Q24-13.** Explain how a balanced scorecard helps with the evaluation process of internal operations.
- Q24-14.** How can a balanced scorecard be used as a strategy implementation tool?

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

Mini Exercises

LO1 M24-15. Multiple Levels of Segment Reporting

Connect Inc. manufactures four different lines of computer devices: modems, routers, servers, and drives. Each of the product lines is produced in all of the company's three plants: Beckley, Huntington, and Charleston. Marketing efforts of the company are divided into five regions: East, West, South, North, and Central.

Required

- a. Develop a reporting schematic that illustrates how the company might prepare single-level reports segmented on three different bases.
- b. Develop a segment reporting schematic that has three different levels. Be sure to identify each segment's level. Briefly explain why you chose the primary-level segment.

M24-16. Income Statements Segmented by Territory

Writing Inc. has two product lines. The September income statements of each product line and the company are as follows:

LO1

WRITING INC. Product Line and Company Income Statements For Month of September

	Pens	Pencils	Total
--	------	---------	-------

**M24-16. Income Statements Segmented by Territory**

Writing Inc. has two product lines. The September income statements of each product line and the company are as follows:

LO1

WRITING INC. Product Line and Company Income Statements For Month of September			
	Pens	Pencils	Total
Sales.....	\$45,000	\$45,000	\$90,000
Less variable expenses.....	(18,000)	(18,000)	(36,000)
Contribution margin.....	27,000	27,000	54,000
Less direct fixed expenses.....	(13,500)	(10,500)	(24,000)
Product margin.....	<u>\$13,500</u>	<u>\$16,500</u>	30,000
Less common fixed expenses.....			<u>(9,000)</u>
Net income.....			<u>\$21,000</u>



Pens and pencils are sold in two territories, Vermont and Washington, as follows:

	Vermont	Washington
Pen sales.....	\$27,000	\$18,000
Pencil sales.....	<u>13,500</u>	<u>31,500</u>
Total sales.....	<u>\$40,500</u>	<u>\$49,500</u>

The common fixed expenses are traceable to each territory as follows:

Vermont fixed expenses	\$3,000
Washington fixed expenses.....	4,500
Home office administration fixed expenses	1,500
Total common fixed expenses.....	<u>\$9,000</u>

The direct fixed expenses of pens, \$13,500, and of pencils, \$10,500, cannot be identified with either territory. The company's accountants were unable to allocate any of the common fixed expenses to the various segments.

Required

Prepare income statements segmented by territory for September, including a column for the entire firm.

M24-17. Income Statements Segmented by Products

Francisco Consulting Firm provides three types of client services in three health-care-related industries. The income statement for July is as follows:

LO1



FRANCISCO CONSULTING FIRM Income Statement For Month of July		
Sales.....		\$450,000
Less variable costs.....		(325,000)
Contribution margin.....		125,000
Less fixed expenses		
Service.....	\$35,000	
Selling and administrative.....	32,500	(67,500)



FRANCISCO CONSULTING FIRM Income Statement For Month of July		
Sales.....	\$450,000	
Less variable costs.....	(325,000)	
Contribution margin.....	125,000	
Less fixed expenses		
Service.....	\$35,000	
Selling and administrative	32,500	(67,500)
Net income.....	\$ 57,500	

The sales, contribution margin ratios, and direct fixed expenses for the three types of services are as follows:

	Hospitals	Physicians	Nursing Care
Sales.....	\$175,000	\$125,000	\$150,000
Contribution margin ratio.....	25%	35%	25%
Direct fixed expenses of services.....	\$ 10,000	\$ 9,000	\$ 8,000
Allocated common fixed services expense.....	\$ 500	\$ 500	\$ 750

Required

Prepare income statements segmented by client categories. Include a column for the entire firm in the statement.

LO2 M24-18. Internal or External Acquisitions: No Opportunity Costs

The Van Division of Travel Vans Corporation has offered to purchase 180,000 wheels from the Wheel Division for \$76 per wheel. At a normal volume of 500,000 wheels per year, production costs per wheel for the Wheel Division are as follows:

Direct materials.....	\$26
Direct labor.....	20
Variable overhead.....	12
Fixed overhead.....	30
Total	\$88

The Wheel Division has been selling 500,000 wheels per year to outside buyers at \$106 each. Capacity is 700,000 wheels per year. The Van Division has been buying wheels from outside suppliers at \$100 per wheel.

Required

- Should the Wheel Division manager accept the offer? Show computations.
- From the standpoint of the company, will the internal sale be beneficial?

LO2 M24-19. Transfer Prices at Full Cost with Excess Capacity: Divisional Viewpoint

Karakomi Cameras Inc. has a Disposables Division that produces a camera that sells for \$13.00 per unit in the open market. The cost of the product is \$9.50 (variable manufacturing of \$5.00, plus fixed manufacturing of \$4.50). Total fixed manufacturing costs are \$315,000 at the normal annual production volume of 70,000 units. The Overseas Division has offered to buy 20,000 units at the full cost of \$9.50. The Disposables Division has excess capacity, and the 20,000 units can be produced without interfering with the current outside sales of 70,000 units. The total fixed cost of the Disposables Division will not change.

Required

Explain whether the Disposables Division should accept or reject the offer. Show calculations.

LO2 M24-20. Transfer Pricing with Excess Capacity: Divisional and Corporate Viewpoints

Affordable Art Company has a Print Division that is currently producing 100,000 prints per year but has a capacity of 150,000 prints. The variable costs of each print are \$28, and the annual fixed costs are \$1,200,000. The prints sell for \$40 in the open market. The company's Retail Division wants to buy



50,000 prints at \$22 each. The Print Division manager refuses the order because the price is below variable cost. The Retail Division manager argues that the order should be accepted because it will lower the fixed cost per print from \$12 to \$8.

Required

- Should the Retail Division order be accepted? Why or why not?
- From the viewpoints of the Print Division and the company, should the order be accepted if the manager of the Retail Division intends to sell each print in the outside market for \$37 after incurring additional costs of \$8 per print?
- What action should the company take, assuming it believes in divisional autonomy?



50,000 prints at \$22 each. The Print Division manager refuses the order because the price is below variable cost. The Retail Division manager argues that the order should be accepted because it will lower the fixed cost per print from \$12 to \$8.

Required

- a. Should the Retail Division order be accepted? Why or why not?
- b. From the viewpoints of the Print Division and the company, should the order be accepted if the manager of the Retail Division intends to sell each print in the outside market for \$37 after incurring additional costs of \$8 per print?
- c. What action should the company take, assuming it believes in divisional autonomy?

M24-21. ROI and Residual Income: Impact of a New Investment**LO3**

The Stallion Division of Motortown Motors had an operating income of \$675,000 and net assets of \$2,700,000. Motortown Motors has a target rate of return of 23 percent.

Required

- a. Compute the return on investment.
- b. Compute the residual income.
- c. The Stallion Division has an opportunity to increase operating income by \$100,000 with an \$675,000 investment in assets.
 1. Compute the Stallion Division's return on investment if the project is undertaken. (Round your answer to three decimal places.)
 2. Compute the Stallion Division's residual income if the project is undertaken.

M24-22. ROI: Fill in the Unknowns**LO3**

Provide the missing data in the following situations:



	Eastern Division	Western Division	Southern Division
Sales.....	?	\$6,000,000	?
Net operating income	\$180,000	\$ 360,000	\$120,000
Operating assets.....	?	?	\$600,000
Return on investment	25%	18%	?
Return on sales	0.05	?	0.08
Investment turnover.....	?	?	2.5

**M24-23. Selection of Balanced Scorecard Items****LO4**

The Worldwide Auditors' Association is a professional association. Its current membership totals 97,600 worldwide. The association operates from a central headquarters in New Zealand but has local membership units throughout the world. The local units hold monthly meetings to discuss recent developments in accounting and to hear professional speakers on topics of interest. The association's journal, *Worldwide Auditor*, is published monthly with feature articles and topical interest areas. The association publishes books and reports and sponsors continuing education courses. A statement of revenues and expenses follows:

WORLDWIDE AUDITORS' ASSOCIATION	
Statement of Revenues and Expenses	
For Year Ending November 30, 2017	
(\$ in thousands)	
Revenues.....	\$55,054
Expenses	
Salaries	\$29,000
Other personnel costs.....	6,786
Occupancy costs	5,650
Reimbursement to local units.....	1,600
Other membership services	1,000
Printing and paper.....	640
Postage and shipping.....	242
General and administrative	1,076
Excess of revenues over expenses	(45,994) \$ 9,060

Additional information follows:

- Membership dues are \$400 per year, of which \$100 is considered to cover a one-year subscription to the association's journal. Other benefits include membership in the association and unit affiliation.
- One-year subscriptions to *Worldwide Auditor* are sold to nonmembers for \$160 each. A total of 2,500 of these subscriptions were sold. In addition to subscriptions, the journal generated \$400,000 in advertising revenue. The cost per magazine was \$40.
- A total of 30,000 technical reports were sold by the Books and Reports Department at an average unit selling price of \$90. Average costs per publication were \$24.



Additional information follows:

- Membership dues are \$400 per year, of which \$100 is considered to cover a one-year subscription to the association's journal. Other benefits include membership in the association and unit affiliation.
- One-year subscriptions to *Worldwide Auditor* are sold to nonmembers for \$160 each. A total of 2,500 of these subscriptions were sold. In addition to subscriptions, the journal generated \$400,000 in advertising revenue. The cost per magazine was \$40.
- A total of 30,000 technical reports were sold by the Books and Reports Department at an average unit selling price of \$90. Average costs per publication were \$24.
- The association offers a variety of continuing education courses to both members and nonmembers. During 2017, the one-day course, which cost participants an average of \$500 each, was attended by 31,300 people. A total of 1,985 people took two-day courses at a cost of \$800 per person.
- General and administrative expenses include all other costs incurred by the corporate staff to operate the association.
- The organization has net capital assets of \$90,060,000 and had an actual cost of capital of 9 percent.

Required

- a. Give some examples of key financial performance indicators (no computations needed) that could be part of a balanced scorecard for the IAA.
- b. Give some examples of key customer and operating performance indicators (no computations needed) that could be part of a balanced scorecard for IAA.

Exercises

LO2 E24-24. Appropriate Transfer Prices: Opportunity Costs

J. Carter Peanut Butter Company recently acquired a peanut-processing company that has a normal annual capacity of 4,000,000 pounds and that sold 2,800,000 pounds last year at a price of \$3.50 per pound. The purpose of the acquisition is to furnish peanuts for the peanut butter plant, which needs 1,600,000 pounds of peanuts per year. It has been purchasing peanuts from suppliers at the market price. Production costs per pound of the peanut-processing company are as follows:

Direct materials.....	\$0.90
Direct labor.....	0.52
Variable overhead.....	0.22
Fixed overhead at normal capacity.....	0.30
Total	<u>\$1.94</u>

Management is trying to decide what transfer price to use for sales from the newly acquired Peanut Division to the Peanut Butter Division. The manager of the Peanut Division argues that \$3.50, the market price, is appropriate. The manager of the Peanut Butter Division argues that the cost price of \$1.94 (or perhaps even less) should be used since fixed overhead costs should be recomputed. Any output of the Peanut Division up to 2,800,000 pounds that is not sold to the Peanut Butter Division could be sold to regular customers at \$3.50 per pound.

Required

- a. Compute the annual gross profit for the Peanut Division using a transfer price of \$3.50.
- b. Compute the annual gross profit for the Peanut Division using a transfer price of \$1.94.
- c. What transfer price(s) will lead the manager of the Peanut Butter Division to act in a manner that will maximize company profits?

LO2 E24-25. Negotiating a Transfer Price with Excess Capacity

The Foundry Division of Findlay Pumps Inc. produces metal parts that are sold to the company's Assembly Division and to outside customers. Operating data for the Foundry Division for 2017 are as follows:



	To the Assembly Division	To Outside Customers	Total
Sales			
400,000 parts × \$6.00.....	\$2,400,000		
300,000 parts × \$6.50		\$1,950,000	\$4,350,000
Variable expenses at \$3.00.....	(1,200,000)	(900,000)	(2,100,000)
Contribution margin.....	1,200,000	1,050,000	2,250,000
Fixed expenses*	(700,000)	(525,000)	1,225,000
Net income.....	\$1,500,000	\$525,000	\$2,025,000



	To the Assembly Division	To Outside Customers	Total
Sales			
400,000 parts × \$6.00.....	\$2,400,000		
300,000 parts × \$6.50		\$1,950,000	\$4,350,000
Variable expenses at \$3.00.....	<u>(1,200,000)</u>	<u>(900,000)</u>	<u>(2,100,000)</u>
Contribution margin.....	1,200,000	1,050,000	2,250,000
Fixed expenses*	<u>(700,000)</u>	<u>(525,000)</u>	<u>1,225,000</u>
Net income.....	<u><u>\$ 500,000</u></u>	<u><u>\$ 525,000</u></u>	<u><u>\$1,025,000</u></u>

*Allocated on the basis of unit sales.

The Assembly Division has just received an offer from an outside supplier to supply parts at \$4.50 each. The Foundry Division manager is not willing to meet the \$4.50 price. She argues that it costs her \$4.75 per part to produce and sell to the Assembly Division, so she would show no profit on the Assembly Division sales. Sales to outside customers are at a maximum, 300,000 parts.

Required

- Verify the Foundry Division's \$4.75 unit cost figure.
- Should the Foundry Division meet the outside price of \$4.50 for Assembly Division sales? Explain.
- Could the Foundry Division meet the \$4.50 price and still show a net profit for sales to the Assembly Division? Show computations.

E24-26. Dual Transfer Pricing

The Athens Company has two divisions, Alpha and Delta. Delta Division produces a product at a variable cost of \$7 per unit, and sells 150,000 units to outside customers at \$12 per unit and 40,000 units to Alpha Division at variable cost plus 40 percent. Under the dual transfer price system, Alpha Division pays only the variable cost per unit. Delta Division's fixed costs are \$275,000 per year. Alpha Division sells its finished product to outside customers at \$25 per unit. Alpha has variable costs of \$5 per unit, in addition to the costs from Delta Division. Alpha Division's annual fixed costs are \$180,000. There are no beginning or ending inventories.

LO2



- Required**
- Prepare the income statements for the two divisions and the company as a whole.
 - Why is the income for the company less than the sum of the profit figures shown on the income statements for the two divisions? Explain.
- E24-27. ROI and Residual Income: Basic Computations**

Watkins Associated Industries is a highly diversified company with three divisions: Trucking, Seafood, and Construction. Assume that the company uses return on investment and residual income as two of the evaluation tools for division managers. The company has a minimum desired rate of return on investment of 15 percent with a 30 percent tax rate. Selected operating data for three divisions of the company follow.

LO3

Watkins Associated Industries



	Trucking Division	Seafood Division	Construction Division
Sales.....	\$1,250,000	\$800,000	\$950,000
Operating assets.....	650,000	300,000	400,000
Net operating income	146,250	52,800	79,600

Required

- Compute the return on investment for each division. (Round answers to three decimal places.)
- Compute the residual income for each division.

E24-28. ROI and Residual Income: Assessing Performance

Refer to the computations in the previous exercise E24-27. Assess the performance of the division managers, basing your conclusions on ROI. Assess the performance of the division managers, basing your conclusions on Residual Income. Which manager is doing the best job?

LO3

LO3 E24-29. ROI, Residual Income, and EVA with Different Bases

Envision Company has a target return on capital of 12 percent. The following financial information is available for October (\$ thousands):



	Software Division (Value Base)		Consulting Division (Value Base)		Venture Capital Division (Value Base)	
	Book	Current	Book	Current	Book	Current
Sales	\$100,000	\$100,000	\$200,000	\$200,000	\$800,000	\$800,000

**LO3 E24-29. ROI, Residual Income, and EVA with Different Bases**

Envision Company has a target return on capital of 12 percent. The following financial information is available for October (\$ thousands):

	Software Division (Value Base)		Consulting Division (Value Base)		Venture Capital Division (Value Base)	
	Book	Current	Book	Current	Book	Current
Sales.....	\$100,000	\$100,000	\$200,000	\$200,000	\$800,000	\$800,000
Income.....	12,250	11,700	16,400	20,020	56,730	51,920
Assets.....	70,000	90,000	100,000	110,000	610,000	590,000
Liabilities.....	10,000	10,000	14,000	14,000	40,000	40,000

Required

- Compute the return on investment using both book and current values for each division. (Round answers to three decimal places.)
- Compute the residual income for both book and current values for each division.
- Compute the economic value added income for both book and current values for each division if the tax rate is 30 percent and the weighted average cost of capital is 10 percent.
- Does book value or current value provide a better basis for performance evaluation? Which division do you consider the most successful?

**LO4 E24-30. Balanced Scorecard Preparation**

The following information is in addition to that presented in Mini Exercise 24-23 for the Worldwide Auditors' Association. For the year ended November 30, 2017, the organization had set a membership goal of 100,000 members with the following anticipated results:

Worldwide Auditors' Association Planned Revenues and Expenses For Year Ending November 30, 2017		
(\$ in thousands)		
Revenues.....		\$55,859.6
Expenses		
Salaries	27,900.0	
Other personnel costs.....	6,975.0	
Occupancy costs	3,859.6	
Reimbursement to local units.....	1,480.0	
Other membership services.....	1,050.0	
Printing and paper.....	525.0	
Postage and shipping.....	220.0	
General and administrative	1,090.0	<u>(43,099.6)</u>
Excess of revenues over expenses		<u>\$12,760.0</u>

Additional information follows:

- Membership dues were increased from \$360 to \$400 at the beginning of the year.
- One-year subscriptions to *Worldwide Auditor* were anticipated to be 2,400 units.
- Advertising revenue was budgeted at \$320,000. Each magazine was budgeted at a cost of \$36.
- A total of 29,000 technical reports were anticipated at an average price of \$80 with average costs of \$22.
- The budgeted one-day courses had an anticipated attendance of 33,000 with an average fee of \$450. The two-day courses had an anticipated attendance of 3,000 with an average fee of \$770 per person.
- The organization began the year with net capital assets of \$88,000,000 with a planned cost of capital of 9 percent.

Required

- Prepare a balanced scorecard for IAA for November 2017 with calculated key performance indicators presented in two columns for planned performance and actual performance—include key financial, customer, and operating performance indicators.
- Which of the evaluation areas you selected indicated success and which indicated failure?
- Give some explanations of the successes and failures.

**Required**

- a. Prepare a balanced scorecard for IAA for November 2017 with calculated key performance indicators presented in two columns for planned performance and actual performance—include key financial, customer, and operating performance indicators.
- b. Which of the evaluation areas you selected indicated success and which indicated failure?
- c. Give some explanations of the successes and failures.

Problems**P24-31. Multiple Segment Reports****LO1**

Worldwide Communications, Incorporated, sells telecommunication products throughout the world in three sales territories: Europe, Asia, and the Americas. For July, all \$650,000 of administrative expense is traceable to the territories, except \$100,000, which is common to all units and cannot be traced or allocated to the sales territories. The percentage of product line sales made in each of the sales territories and the assignment of traceable fixed expenses follow:

	Sales Territory			
	Europe	Asia	The Americas	Total
Handset sales	50%	30%	20%	100%
Switchboard sales	40	40	20	100
Automated switches sales	10	30	60	100
Fixed administrative expense	\$200,000	\$200,000	\$150,000	\$ 550,000
Fixed selling expense.....	\$350,000	\$650,000	\$650,000	\$1,650,000

The manufacturing takes place in one large facility with three distinct manufacturing operations. Selected product-line cost data follow.

	Handset	Switchboard	Automated Switches	Total
Variable costs.....	\$ 18	\$ 790	\$ 1,975	
Depreciation and supervision.....	200,000	200,000	170,000	\$ 600,000*
Other mfg. overhead (common).....				150,000
Fixed administrative expense (common).....				650,000
Fixed selling expense (common).....				1,550,000

*Includes common costs of \$30,000

The unit sales and selling prices for each product follow.

	Unit Sales	Selling Price
Handset.....	10,500	\$ 50
Switchboard.....	2,500	1,500
Automated	2,000	3,200

Required

- a. Prepare an income statement for July segmented by product line. Include a column for the entire firm.
- b. Prepare an income statement for July segmented by sales territory. Include a column for the entire firm.
- c. Prepare an income statement for July by product line for The Americas sales territory. Include a column for the territory as a whole.
- d. Discuss the value of multilevel segment reporting as a managerial tool. Compare and contrast the benefits of the reports generated in parts a, b, and c.

LO1 P24-32. Segment Reporting and Analysis

California Bread Company bakes three products: donuts, bread, and pastries. It sells them in the cities of San Francisco and San Jose. For March, its first month of operation, the following income statement was prepared:

CALIFORNIA BREAD COMPANY			
Territory and Company Income Statements			
For Month of March			
San Francisco	San Jose		Total

**LO1 P24-32. Segment Reporting and Analysis**

California Bread Company bakes three products: donuts, bread, and pastries. It sells them in the cities of San Francisco and San Jose. For March, its first month of operation, the following income statement was prepared:

CALIFORNIA BREAD COMPANY Territory and Company Income Statements For Month of March			
	San Francisco	San Jose	Total
Sales.....	\$4,200	\$1,000	\$5,200
Cost of goods sold	(3,000)	(600)	(3,600)
Gross profit.....	1,200	400	1,600
Selling and administrative expenses.....	(800)	(450)	(1,250)
Net income.....	<u>\$ 400</u>	<u>\$ (50)</u>	<u>\$ 350</u>

Sales and selected variable expense data are as follows:

	Products		
	Donuts	Bread	Pastries
Fixed baking expenses	\$ 400	\$ 280	\$200
Variable baking expenses as a percentage of sales.....	50%	50%	60%
Variable selling expenses as a percentage of sales.....	4%	4%	6%
City of San Francisco, sales.....	\$1,700	\$1,800	\$700
City of San Jose, sales.....	\$ 400	\$ 300	\$300

The fixed selling expenses were \$770 for March, of which \$320 was a direct expense of the San Francisco market and \$450 was a direct expense of the San Jose market. Fixed administrative expenses were \$260, which management has decided not to allocate when using the contribution approach.

Required

- Prepare a segment income statement showing the territory margin for each sales territory for March. Include a column for the entire firm.
- Prepare segment income statements showing the product margin for each product. Include a column for the entire firm.
- If the pastries line is dropped and fixed baking expenses do not change, what is the product margin for donuts and bread?
- What other type of segmentation might be useful to California Bread. Explain.

LO1 P24-33. Segment Reporting and Analysis

College Textbook Publishers Inc. has prepared income statements segmented by divisions, but management is still uncertain about actual performance. Financial information for May is given as follows:

	Textbook Division	Professional Division	Company Total
Sales.....	\$100,000	\$205,000	\$305,000
Less variable expenses			
Manufacturing.....	16,000	102,500	118,500
Selling and administrative	2,200	12,300	14,500
Total	<u>(18,200)</u>	<u>(114,800)</u>	<u>(133,000)</u>
Contribution margin.....	81,800	90,200	172,000
Less direct fixed expenses.....	(10,000)	(100,000)	(110,000)
Net income.....	<u>\$ 71,800</u>	<u>\$ (9,800)</u>	<u>\$ 62,000</u>

Management is concerned about the Professional Division and requests additional analysis. Additional information regarding May operations of the Professional Division is as follows:

	Professional Division		
	Accounting Books Segment	Executive Books Segment	Management Books Segment
Sales.....	\$70,000	\$70,000	\$65,000
Variable manufacturing expenses as a percentage of sales.....	60%	40%	50%
Other variable expenses.....	0	0	0



	Professional Division		
	Accounting Books Segment	Executive Books Segment	Management Books Segment
Sales.....	\$70,000	\$70,000	\$65,000
Variable manufacturing expenses as a percentage of sales.....	60%	40%	50%
Other variable expenses as a percentage of sales.....	6%	6%	6%
Direct fixed expenses.....	\$25,000	\$36,750	\$25,000
Allocated common fixed expenses	\$ 2,000	\$ 1,000	\$ 3,000

The professional accounting books are sold to auditors and controllers. The current information on these markets is as follows:

	Accounting Books Segment		
	Auditors Market	Controllers Market	Total
Sales.....	\$15,000	\$55,000	\$70,000
Variable manufacturing expenses as a percentage of sales.....	60%	60%	—
Other variable expenses as a percentage of sales.....	6%	6%	—
Direct fixed expenses.....	\$ 7,500	\$15,000	\$22,500
Allocated common fixed expenses	\$ 750	\$ 1,000	\$ 1,750

Required

- Prepare an income statement segmented by product for the Professional Division. Include a column for the division as a whole.
- Prepare an income statement segmented by market for the Accounting Books Segment of the Professional Division.
- Evaluate which Accounting Books Segment the Professional Division should keep or discontinue in the short run.
- What is the correct long-run decision? Explain fully, including any possible risks associated with your recommendation.

P24-34. Segment Reports and Cost Allocations

All Things Greek Inc. has three sales divisions. One of the key evaluation inputs for each division manager is the performance of his or her division based on division income. The division statements for August are as follows:

	Alpha	Beta	Gamma	Total
Sales.....	\$200,000	\$250,000	\$225,000	\$675,000
Cost of sales.....	100,000	120,000	115,000	335,000
Division overhead.....	<u>50,000</u>	<u>55,000</u>	<u>55,000</u>	<u>160,000</u>
Division expenses.....	(150,000)	(175,000)	(170,000)	(495,000)
Division contribution	50,000	75,000	55,000	180,000
Corporate overhead.....	(35,000)	(45,000)	(40,000)	(120,000)
Division income.....	<u>\$ 15,000</u>	<u>\$ 30,000</u>	<u>\$ 15,000</u>	<u>\$ 60,000</u>

The Gamma manager is unhappy that his profitability is the same as that of the Alpha Division and one-half that of the Beta Division when his sales are halfway between these two divisions. The manager knows that his division must carry more product lines because of customer demands, and many of these additional product lines are not very profitable. He has not dropped these marginal product lines because of idle capacity; all of the products cover their own variable costs. After analyzing the

LO1

product lines with the lowest profit margins, the divisional controller for Gamma provided the following to the manager:

Sales of marginal products	\$45,000
Cost of sales.....	\$25,000
Avoidable fixed costs.....	<u>11,000</u>
Product margin	9,000
Proportion of corporate overhead	(8,000)
Product income.....	<u>\$ 1,000</u>



product lines with the lowest profit margins, the divisional controller for Gamma provided the following to the manager:

Sales of marginal products	\$45,000
Cost of sales.....	\$25,000
Avoidable fixed costs.....	<u>11,000</u>
Product margin	9,000
Proportion of corporate overhead	(8,000)
Product income.....	<u><u>\$ 1,000</u></u>

Although these products were 20 percent of Gamma's total sales, they contributed only about 7 percent of the division's profits. The controller also noted that the corporate overhead allocation was based on a formula of sales and divisional contribution margin.

Required

- a. Prepare a set of segment statements for August assuming that all facts remain the same except that Gamma's weak product lines are dropped and corporate overhead is allocated as follows: Alpha, \$40,000; Beta, \$47,500; and Gamma, \$32,500. Does the Gamma Division appear better after this action? What will be the responses of the other two division managers?
- b. Suggest improvements for All Things Greek's reporting process that will better reflect the actual operations of the divisions. Keep in mind the utilization of the reporting process to assist in the evaluation of the managers. What other changes could be made to improve the manager evaluation process?

LO3 P24-35. ROI, Residual Income, and EVA: Impact of a New Investment

EEG Inc. is a decentralized organization with four autonomous divisions. The divisions are evaluated on the basis of the change in their return on invested assets. Operating results in the Commercial Division for 2017 follow:

EEG INC.—COMMERCIAL DIVISION Income Statement For Year Ending December 31, 2017	
Sales.....	\$1,562,500
Less variable expenses.....	<u>(800,000)</u>
Contribution margin.....	762,500
Less fixed expenses.....	<u>(500,000)</u>
Net operating income	<u><u>\$ 262,500</u></u>

Operating assets for the Commercial Division currently average \$1,500,000. The Commercial Division can add a new product line for an investment of \$250,000. Relevant data for the new product line are as follows:

Sales.....	\$375,000
Variable expenses (% of sales).....	0.60
Fixed expenses	\$125,000
Increase in current liabilities	\$ 10,000

Required

- a. Determine the effect on ROI of accepting the new product line. (Round calculations to three decimal places.)
- b. If a return of 6 percent is the minimum that any division should earn and residual income is used to evaluate managers, would this encourage the division to accept the new product line? Explain and show computations.
- c. If EVA is used to evaluate managers, should the new product line be accepted if the weighted average cost of capital is 6 percent and the income tax rate is 30 percent?

P24-36. Valuing Investment Center Assets

Six Flags Theme Parks Inc. operates theme parks in the United States, Mexico, and Europe. One of its first theme parks, Six Flags over Georgia, was built in the 1960s in Atlanta on a large tract of land that has appreciated enormously over the years. Although most of the rides and other attractions have a fairly short life, some of the major buildings that are still in use on the property have been fully depreciated since they were built. Assume that Six Flags over Georgia operates as an investment center with total assets that have a book value of \$100 million and current liabilities of \$10 million. Assume also that in 2017, this particular theme park had sales of \$120 million and pretax division income of \$20 million. The replacement cost of all the assets in this park is estimated to be \$160 million. The

LO3

Six Flags Theme Parks Inc. (SIX)

**P24-36. Valuing Investment Center Assets**

Six Flags Theme Parks Inc. operates theme parks in the United States, Mexico, and Europe. One of its first theme parks, Six Flags over Georgia, was built in the 1960s in Atlanta on a large tract of land that has appreciated enormously over the years. Although most of the rides and other attractions have a fairly short life, some of the major buildings that are still in use on the property have been fully depreciated since they were built. Assume that Six Flags over Georgia operates as an investment center with total assets that have a book value of \$100 million and current liabilities of \$10 million. Assume also that in 2017, this particular theme park had sales of \$120 million and pretax division income of \$20 million. The replacement cost of all the assets in this park is estimated to be \$160 million. The company has a 35 percent tax rate and a target return of 10% and a cost of capital of 8%.

LO3**Six Flags Theme Parks Inc. (SIX)****Required**

- a. Calculate the ROI, residual income, and EVA for Six Flags over Georgia using book value as the valuation basis for the investment center asset base.
- b. Repeat requirement (a) using replacement cost as the investment center asset value.
- c. Which valuation, accounting book value or replacement cost do you think the company uses to evaluate the managers of its various theme parks? Discuss.

P24-37. Transfer Pricing with and without Capacity Constraints**LO2, 3**

Elise Carpets Inc. has just acquired a new backing division that produces a rubber backing, which it sells for \$3.30 per square yard. Sales are about 1,200,000 square yards per year. Since the Backing Division has a capacity of 2,000,000 square yards per year, top management is thinking that it might be wise for the company's Tufting Division to start purchasing from the newly acquired Backing Division. The Tufting Division now purchases 600,000 square yards per year from an outside supplier at a price of \$3.00 per square yard. The current price is lower than the competitive \$3.30 price as a result of the large quantity discounts. The Backing Division's cost per square yard follows.

Direct materials.....	\$1.80
Direct labor.....	0.45
Variable overhead.....	0.37
Fixed overhead (1,200,000 level)	0.15
Total cost.....	<u><u>\$2.77</u></u>

Required

- a. If both divisions are to be treated as investment centers and their performance evaluated by the ROI formula, what transfer price would you recommend? Why?
- b. If fixed costs are assumed not to change, determine the effect on corporate profits of making the backing.
- c. Based on your transfer price, would you expect the ROI in the Backing Division to increase, decrease, or remain unchanged? Explain.
- d. What would be the effect on the ROI of the Tufting Division using your transfer price? Explain.
- e. Assume that the Backing Division is now selling 2,000,000 square yards per year to retail outlets. What transfer price would you recommend? What will be the effect on corporate profits?
- f. If the Backing Division is at capacity and decides to sell to the Tufting Division for \$3.00 per square yard, what will be the effect on the company's profits?

P24-38. Transfer Pricing and Special Orders**LO2**

Washington State Products has several manufacturing divisions. The Seattle Division produces a component part that is used in the manufacture of electronic equipment. The cost per part for July is as follows:

Variable cost.....	\$160
Fixed cost (at 2,000 units per month capacity)	120
Total cost per part.....	<u><u>\$280</u></u>

Some of Seattle Division's output is sold to outside manufacturers, and some is sold internally to the Redmond Division. The price per part is \$400. The Redmond Division's cost and revenue structure follow.

Selling price per unit	\$2,000
Less variable costs per unit	
Cost of parts from the Seattle Division	\$400
Other variable costs.....	800
Contribution margin per unit.....	<u><u>800</u></u>
Less fixed costs per unit (at 2,000 units per month)	(200)
Net income per unit.....	<u><u>\$ 600</u></u>



Selling price per unit	\$2,000
Less variable costs per unit	
Cost of parts from the Seattle Division	\$400
Other variable costs.....	800
Contribution margin per unit.....	(1,200)
Less fixed costs per unit (at 2,000 units per month)	800
Net income per unit	(200)
	\$ 600

The Redmond Division received a one-time order for 10 units. The buyer wants to pay only \$970 per unit.

Required

- a. From the perspective of the Redmond Division, should the \$970 price be accepted? Explain.
- b. If both divisions have excess capacity, would the Redmond Division's action benefit the company as a whole? Explain.
- c. If the Redmond Division has excess capacity but the Seattle Division does not and can sell all of its parts to outside manufacturers, what would be the advantage or disadvantage of accepting the ten-unit order at the \$970 price to the Redmond Division?
- d. To make a decision that is in the best interest of the company, what transfer-pricing information does the Redmond Division need?

LO4 P24-39. Balanced Scorecard

The Willowbrook Community Bank recently decided to adopt a balanced scorecard system of performance evaluation. Below is a list of primary performance goals for four major performance categories that have been identified by corporate management and the board of directors.

1. Financial Perspective—Maintain and grow the bank financially
 - a. Increase customer deposits
 - b. Manage financial risk
 - c. Provide profits for the stockholders
2. Customer Perspective – Maintain and grow the customer base
 - a. Increase customer satisfaction
 - b. Increase number of depositors & customer retention
 - c. Increase quality of deposits
3. Internal Perspective – Improve internal processes
 - a. Achieve best practices for processing transactions
 - b. Improve employee satisfaction
 - c. Improve employee promotion opportunities
4. Learning and Innovation – Improve market differentiation
 - a. Beat competitors in introducing new products
 - b. Become first mover in establishing customer benefit for customers
 - c. Become recognized as an innovator in the industry

Required

- a. For each of the 12 goals above suggest at least one measure of performance to measure the achievement of the goal.
- b. At what level of the organization should the balanced scorecard be implemented as a means of evaluating performance? Explain.

Management Applications

LO2 MA24-40. Transfer Price Decisions

IBM Corporation (IBM)

The Consulting Division of **IBM Corporation** is often involved in assignments for which IBM computer equipment is sold as part of a systems installation. The Computer Equipment Division is frequently a vendor of the Consulting Division in cases for which the Consulting Division purchases the equipment from the Computer Equipment Division. The Consulting Division does not view itself as a sales arm of the Computer Equipment Division but as a strong competitor to the major consulting firms of information systems. The Consulting Division's goal is to maximize its profit contribution to

the company, not necessarily to see how much IBM equipment it can sell. If the Consulting Division is truly an autonomous investment center, it has the freedom to purchase equipment from competing vendors if the consultants believe that a competitor's products serve the needs of a client better than the comparable IBM product in a particular situation.

Required

- a. In this situation, should corporate management be concerned about whether the Consulting Division sells IBM products or those of other computer companies? Should the Consulting Division be required to sell only IBM products?
- b. Discuss the transfer-pricing issues that both the Computer Equipment Division manager and the



the company, not necessarily to see how much IBM equipment it can sell. If the Consulting Division is truly an autonomous investment center, it has the freedom to purchase equipment from competing vendors if the consultants believe that a competitor's products serve the needs of a client better than the comparable IBM product in a particular situation.

Required

- a. In this situation, should corporate management be concerned about whether the Consulting Division sells IBM products or those of other computer companies? Should the Consulting Division be required to sell only IBM products?
- b. Discuss the transfer-pricing issues that both the Computer Equipment Division manager and the Consulting Division manager should consider. If top management does not have a policy on pricing transfers between these two divisions, what alternative transfer prices should the division managers consider?
- c. What is your recommendation regarding how the managers of the Consulting and Computer Equipment Divisions can work together in a way that will benefit each of them individually and the company as a whole?

MA24-41. Transfer Pricing at Absorption Cost

LO2

The Injection Molding Division of Universal Sign Company produces molded parts that are sold to the Sign Division. This division uses the parts in constructing signs that are sold to various businesses. The Molding Division contains two operations, injection and finishing. The unit variable cost of materials and labor used in the injection operation is \$100. The fixed injection overhead is \$800,000 per year. Current production (20,000 units) is at full capacity. The variable cost of labor used in the finishing operation is \$16 per part. The fixed overhead in this operation is \$340,000 per year. The company uses an absorption-cost transfer price. The price data for each operation presented to the Sign Division by the Molding Division follow.

Injection		
Variable cost per unit.....	\$100	
Fixed overhead cost per unit (\$800,000 ÷ 20,000 units).....	<u>40</u>	\$140
Finishing		
Labor cost per unit.....	16	
Fixed overhead cost per unit (\$340,000 ÷ 20,000 units).....	<u>17</u>	33
Total cost per unit.....		<u><u>\$173</u></u>

An outside company has offered to lease machinery to the Sign Division that would perform the finishing portion of the parts manufacturing for \$200,000 per year. With the new machinery, the labor cost per part would remain at \$16. If the Molding Division transfers the units for \$140, the following analysis can be made:

Current process		
Finishing process costs (20,000 × \$33)		\$660,000
New process		
Machine rental cost per year	\$200,000	
Labor cost (\$16 × 20,000 units).....	<u>320,000</u>	(520,000)
Savings.....		<u><u>\$140,000</u></u>

The manager of the Sign Division wants approval to acquire the new machinery.

Required

- a. How would you advise the company concerning the proposed lease?
- b. How could the transfer-pricing system be modified or the transfer-pricing problem eliminated?

MA24-42. Transfer Pricing Dispute

LO2

MBR Inc. consists of three divisions that were formerly three independent manufacturing companies. Bader Corporation and Roper Company merged in 2016, and the merged corporation acquired Mitchell Company in 2017. The name of the corporation was subsequently changed to MBR Inc., and each company became a separate division retaining the name of its former company.

The three divisions have operated as if they were still independent companies. Each division has its own sales force and production facilities. Each division management is responsible for sales, cost

of operations, acquisition and financing of divisional assets, and working capital management. The corporate management of MBR evaluates the performance of the divisions and division management on the basis of return on investment.

Mitchell Division has just been awarded a contract for a product that uses a component manufactured by the Roper Division and also by outside suppliers. Mitchell used a cost figure of \$3.80 for the component manufactured by Roper in preparing its bid for the new product. Roper supplied this cost figure in response to Mitchell's request for the average variable cost of the component; it represents the standard variable manufacturing cost and variable selling and distribution expenses.

Roper has an active sales force that is continually soliciting new prospects. Roper's regular selling price for the component Mitchell needs for the new product is \$6.50. Sales of this component are



of operations, acquisition and financing of divisional assets, and working capital management. The corporate management of MBR evaluates the performance of the divisions and division management on the basis of return on investment.

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Roper has an active sales force that is continually soliciting new prospects. Roper's regular selling price for the component Mitchell needs for the new product is \$6.50. Sales of this component are expected to increase. The Roper management has indicated, however, that it could supply Mitchell the required quantities of the component at the regular selling price less variable selling and distribution expenses. Mitchell's management has responded by offering to pay standard variable manufacturing cost plus 20 percent.

The two divisions have been unable to agree on a transfer price. Corporate management has never established a transfer-pricing policy because interdivisional transactions have never occurred. As a compromise, the corporate vice president of finance suggested a price equal to the standard full manufacturing cost (i.e., no selling and distribution expenses) plus a 15 percent markup. The two division managers have also rejected this price because each considered it grossly unfair.

The unit cost structure for the Roper component and the three suggested prices follow.

Standard variable manufacturing cost	\$3.20
Standard fixed manufacturing cost.....	1.20
Variable selling and distribution expenses	0.60
	<u><u>\$5.00</u></u>
Regular selling price less variable selling and distribution expenses (\$6.50 – \$0.60)....	\$5.90
Standard full manufacturing cost plus 15% (\$4.40 × 1.15)	\$5.06
Variable manufacturing plus 20% (\$3.20 × 1.20)	\$3.84

Required

- What should be the attitude of the Roper Division's management toward the three proposed prices?
- Is the negotiation of a price between the Mitchell and Roper Divisions a satisfactory method of solving the transfer-pricing problem? Explain your answer.
- Should the corporate management of MBR Inc. become involved in this transfer-price controversy? Explain your answer.

(CMA Adapted)

Solutions to Review Problems

Review 24-1—Solution

a.

	Segments (Territories)		
	U.S.	International	Wireless Total
Sales	\$12,000	\$18,000	\$30,000
Less variable costs	(8,400)	(12,600)	(21,000)
Contribution margin	3,600	5,400	9,000
Less direct fixed costs.....	(500)	(800)	(1,300)
Territory margin	3,100	4,600	7,700
Less allocated segment costs.....	(200)	(600)	(800)
Territory income	\$ 2,900	\$ 4,000	6,900
Less unallocated common costs			(900)
Wireless income			\$ 6,000

- b. The Product Margin for the wireless product line in Panel B was \$7,000 and reflected \$2,000 of direct fixed costs that were attributable to that product line in the National Division. However, when the wireless product segment income statement is further segmented into geographic segments, only \$1,300 of the \$2,000 could be directly traced to the two geographic territories. Therefore, \$700 of costs that were direct costs at the product segment level became common costs (either allocated or unallocated) at the territory segment level. This reflects the general notion that as segmentation is extended down to lower and lower levels, the total amount of common costs increase and direct costs decrease. Hence, segmentation rarely is extended to more than three levels.

Review 24-2—Solution



- b. The Product Margin for the wireless product line in Panel B was \$7,000 and reflected \$2,000 of direct fixed costs that were attributable to that product line in the National Division. However, when the wireless product segment income statement is further segmented into geographic segments, only \$1,300 of the \$2,000 could be directly traced to the two geographic territories. Therefore, \$700 of costs that were direct costs at the product segment level became common costs (either allocated or unallocated) at the territory segment level. This reflects the general notion that as segmentation is extended down to lower and lower levels, the total amount of common costs increase and direct costs decrease. Hence, segmentation rarely is extended to more than three levels.

Review 24-2—Solution

- a. No.

	Current Sales	Proposed Sales
Selling price	\$ 24.00	\$ 13.50
Variable costs.....	<u>(16.00)</u>	<u>(16.00)</u>
Unit contribution margin.....	\$ 8.00	\$ (2.50)
Unit sales.....	<u>× 200,000</u>	<u>× 100,000</u>
Contribution margin.....	<u><u>\$1,600,000</u></u>	<u><u>\$(250,000)</u></u>

Currently, the division is making \$250,000 on 100,000 posters (\$1,600,000 – \$1,350,000 fixed costs); but under the proposal, with a \$250,000 negative contribution, it would revert to a break-even situation:

Current contribution margin		\$1,600,000
Fixed costs	\$1,350,000	
Loss on special order.....	<u>250,000</u>	<u>(1,600,000)</u>
Net income.....		<u><u>\$ 0</u></u>

As a general rule, a project should never be undertaken if the contribution margin is negative.

- b. What the Retail Division does with the posters after receiving them is of no concern to the Production Division. Hence, the Production Division would still object to a transfer price of \$13.50. However, for the company, the proposal does have a contribution of \$18 per unit (\$44 – \$16 – \$10). Consequently, the order is desirable from the viewpoint of the company.
- c. If the company believes in autonomous divisions, it should not require the Production Division to sell, nor should it dictate a higher transfer price. On the other hand, the company may want to create incentives to encourage (but not require) the two division managers to reach some compromise transfer price that would increase the contribution and profits of both divisions.

Review 24-3—Solution

- a.

$$\text{Return on investment} = \frac{\text{Investment center income}}{\text{Investment center asset base}}$$
$$\begin{aligned}\text{Engineering Division} &= \$30,000 \div \$200,000 \\ &= 0.15, \text{ or } 15 \text{ percent}\end{aligned}$$
$$\begin{aligned}\text{Construction Division} &= \$50,000 \div \$250,000 \\ &= 0.20, \text{ or } 20 \text{ percent}\end{aligned}$$
$$\begin{aligned}\text{Military Division} &= \$22,000 \div \$100,000 \\ &= 0.22, \text{ or } 22 \text{ percent}\end{aligned}$$

- b. $\text{Residual income} = \text{Investment center income} - (\text{Investment center asset base} \times \text{Minimum return})$

$$\begin{aligned}\text{Engineering Division} &= \$30,000 - (0.15 \times \$200,000) \\ &= \$0.00\end{aligned}$$
$$\begin{aligned}\text{Construction Division} &= \$50,000 - (0.15 \times \$250,000) \\ &= \$12,500\end{aligned}$$
$$\begin{aligned}\text{Military Division} &= \$22,000 - (0.15 \times \$100,000) \\ &= \$7,000\end{aligned}$$

- c. ROI ranks the Military Division first, the Construction Division second, and the Engineering Division third. Residual income ranks the Construction Division first, the Military Division second, and the Engineering Division third. Because the investments for each division are different, it is somewhat misleading to rank the divisions according to residual income. The Construction Division had the highest residual income, but it also had the largest investment. The Military Division's residual income was 56 percent of the Construction Division's income but only 40 percent of the investment of the Construction Division. This fact, along with the best ROI ranking, probably justifies the Military Division being evaluated as the best division of KBR.
- d. Return on investment:



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- d. Return on investment:

$$\text{Investment} = \$9,000 \div \$50,000$$

$$= 0.18, \text{ or } 18 \text{ percent}$$

$$\begin{aligned}\text{Engineering Division} &= (\$30,000 + \$9,000) \div (\$200,000 + \$50,000) \\ &= 0.156, \text{ or } 15.6 \text{ percent}\end{aligned}$$

$$\begin{aligned}\text{Construction Division} &= (\$50,000 + \$9,000) \div (\$250,000 + \$50,000) \\ &= 0.1967, \text{ or } 19.67 \text{ percent}\end{aligned}$$

$$\begin{aligned}\text{Military Division} &= (\$22,000 + \$9,000) \div (\$100,000 + \$50,000) \\ &= 0.2067, \text{ or } 20.67 \text{ percent}\end{aligned}$$

ROI will increase for the Engineering Division but decrease for the Construction and Military Divisions, even though the project's ROI of 18 percent exceeds the company's minimum return of 15 percent.
Residual income:

$$\begin{aligned}\text{Engineering Division} &= (\$30,000 + \$9,000) - [0.15 \times (\$200,000 + \$50,000)] \\ &= \$1,500\end{aligned}$$

$$\begin{aligned}\text{Construction Division} &= (\$50,000 + \$9,000) - [0.15 \times (\$250,000 + \$50,000)] \\ &= \$14,000\end{aligned}$$

$$\begin{aligned}\text{Military Division} &= (\$22,000 + \$9,000) - [0.15 \times (\$100,000 + \$50,000)] \\ &= \$8,500\end{aligned}$$

Because the project's ROI exceeds the company's minimum return, the residual income of all divisions will increase.

Review 24-4—Solution

- a. Financial Success
Expense as a % of revenue
Expense variance %
New product ROI
Net profit
Net profit margin
Year-over-year revenue growth
New product revenue

Customer Satisfaction and Brand Improvement

- Number of complaints
- Market share
- Average customer survey rating
- New customer count
- New customer sales value
- Unique repeat customer count

Business Process Improvement

- Average call wait
- Service error rate
- Fulfillment %
- Industry quality rating
- New product acceptance rate
- Number of defects reported
- Time to market on new products

Learning and Growth of Motivated Workforce

- Employee turnover ratio
- Headcount growth
- Job offer acceptance rate

Note that some of the key performance indicators could be included in more than one category. For example New Product ROI is an indicator of the success of introducing new products, but it is also an indicator of financial success.

- b. The balanced scorecard has been quite successful in helping companies to better focus managers' attention on the factors that drive long-term success. If the company focuses on its key drivers, ROI, EVA, and



Learning and Growth of Motivated Workforce
Employee turnover ratio
Headcount growth
Job offer acceptance rate

Note that some of the key performance indicators could be included in more than one category. For example New Product ROI is an indicator of the success of introducing new products, but it is also an indicator of financial success.

- b. The balanced scorecard has been quite successful in helping companies to better focus managers' attention on the factors that drive ultimate success. If only a general performance metric such as ROI or EVA is used to evaluate performance, managers are left on their own to figure out for themselves the components of managerial performance that drive improvements in the overall indicator. Balanced scorecard provides a framework and structure for carefully thinking about the key performance indicators that drive ultimate success. Once top management has identified the key performance indicators with input from all levels, some or all of the indicators can be used to evaluate managers and employees throughout the organization.

Module 25

Capital Budgeting Decisions