

Chapter 12

Performance Evaluation in Decentralized Organizations

AFTER MANAGING A COPY CENTER FOR several years, Aaron Knight began his own business, Knight Copy & PC Center (KCPC). Located in midtown Manhattan, Aaron began KCPC with an initial investment of \$1.5 million and a staff of five. A loyal clientele quickly developed because of the personalized, high-quality service that KCPC provides. Within a few years, Aaron opened several branches in Manhattan and surrounding areas.

Aaron soon found it difficult to manage the day-to-day operations in all of KCPC's branches from his main office. As a result, he hired managers for each store, and three regional managers. However, Aaron is worried that the firm is losing momentum because his managers do not bring the same level of commitment and drive to the business as he does. Aaron seeks our help both in evaluating his branch and regional offices, and in motivating better performance from his managers.

APPLYING THE DECISION FRAMEWORK

What Is the Problem? Aaron is worried about the performance of KCPC's branch offices and the commitment of its managers.

What Are the Options? Aaron has numerous options for defining each manager's role, and for putting in a performance measurement and evaluation system to motivate, monitor, and reward managers.

What Are the Costs and Benefits? We will examine the costs and benefits of delegating decision making (decentralizing) as well as the costs and benefits of using various performance measures and incentives.

Make the Decision! After looking at the various issues associated with performance measurement and evaluation systems in decentralized organizations, Aaron can select the best portfolio of control measures.



Alamy

Aaron Knight of Knight's Copy & PC center is trying to figure out how to motivate, monitor, and reward his employees.


LEARNING OBJECTIVES

After studying this chapter, you will be able to:

- 1 Explain the costs and benefits of decentralization.
- 2 Apply the principles of performance measurement.
- 3 Rate the performance of cost and profit centers.
- 4 Evaluate the performance of investment centers.
- 5 Describe transfer pricing.

In Chapters 9 through 11, you learned how to make planning decisions to support operations over the long run. As we learned in Chapter 1, however, it is not enough just to make plans. Periodically, firms need to evaluate whether everything is going as planned and whether everyone in the organization is on the same page. In this chapter, we discuss how organizations use monitoring, incentives, and performance evaluation systems for these purposes.

We begin this chapter by describing **decentralization**, the practice of delegating decisions to lower-level managers. We then examine some common forms of decentralization and illustrate how effective performance evaluation is vital in decentralized organizations. Following this, we discuss the principles of performance measurement and apply them to decentralized organizations. Finally, we discuss transfer pricing, an important issue that arises when multiple divisions within an organization engage in business transactions with each other.



CHAPTER CONNECTIONS

Our discussion in this chapter complements the material presented in Chapter 8, which focused on profit variances and short-term measures of operating efficiency. Specifically, we consider how organizations can design performance measures to ensure that its employees are motivated to generate favorable outcomes.

Decentralization of Decision Making

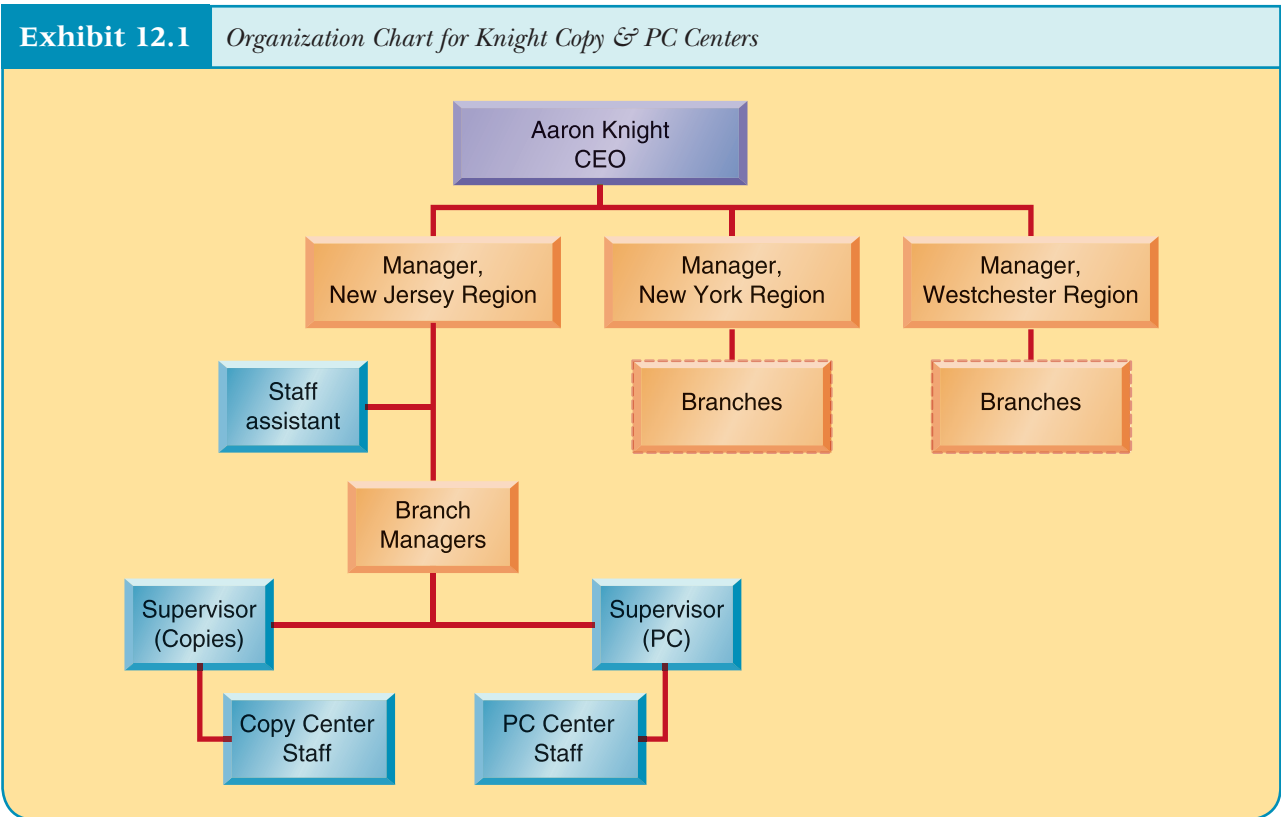
LEARNING OBJECTIVE 1

Explain the costs and benefits of decentralization.

Most organizations grapple with the issue Aaron faces. As firms grow, both the number and type of decisions they must make increase rapidly. We cannot expect any one individual to have all of the relevant expertise and knowledge required to make decisions related to production, marketing, finance, and human resources management. Like Aaron, organizations have no choice but to decentralize by giving lower-level managers the authority to make *specified* decisions.

Consider **Hewlett-Packard (HP)**, a leading manufacturer of personal computers and printers. These two product lines account for a significant portion of **HP**'s business operations. However, one manager cannot manage all aspects of *both* product lines. Therefore, **HP** has organized the personal computer and the printer divisions as two semi-independent organizations run by division managers. The division managers, in turn, assemble their own teams and delegate authority further.

Exhibit 12.1 shows **KCPC**'s organizational structure. The three regional managers make decisions concerning pricing, promotion, office management, and



coordination of the KCPC locations within their region. The branch managers are in charge of a specific store and rely on supervisors to oversee the copy centers and PC operations. Each region also has administrative staff.

BENEFITS AND COSTS OF DECENTRALIZATION

Organizations vary considerably in the extent to which they decentralize. This variation occurs because decisions about whether and how much to decentralize affect numerous costs and benefits. Moreover, the magnitude of these costs and benefits depends on individual circumstances. Exhibit 12.2 summarizes the costs and benefits.

Let us further examine each of these benefits and costs relative to centralized decision making:

Benefits

1. *Permits timely decisions with the best available information.* Employees at lower levels in an organization typically have access to more detailed and timely information than those at higher levels. It is costly and often impractical for lower-level managers to communicate all of the relevant information to top management. For example, a shop floor supervisor can take timelier actions to deal with a machine breakdown or a quality problem than an operations manager could. It therefore makes sense to give local managers the authority to deal with decisions that rely on local knowledge.
2. *Tailors managerial skills and specializations to job requirements.* As organizations grow, managing each aspect of business becomes more challenging. Marketing one product in a local market is much easier than marketing many products nationwide. Both the expertise and experience required to manage each business function increase in the firm's size and complexity. Delegating decision making to individuals with appropriate functional experience enhances decision quality.
3. *Empowers employees and increases job satisfaction.* Decentralizing authority empowers employees at the lower levels. Empowerment is a powerful motivational tool because it gives employees a sense of ownership and often results in increased job satisfaction.
4. *Trains future managers.* A well-managed organization develops and maintains a pool of managerial talent. Ensuring smooth succession is important for the survival of any company. Decentralization prepares employees at the lower level for higher-level positions as they move up the organizational hierarchy.

Costs

1. *Leads to decisions that emphasize local goals over global goals.* Lower-level managers may not understand the "big picture." As a result, they might make decisions

Exhibit 12.2 <i>Costs and Benefits of Decentralization</i>	
Benefits	Costs
<ul style="list-style-type: none"> • Permits timely decisions • Tailors managerial skills and specializations to job requirements • Empowers employees and increases job satisfaction • Trains future managers 	<ul style="list-style-type: none"> • Might lead to an emphasis on local versus global goals • Requires costly coordination of decisions • Leads to improper decisions because of divergence between individual and organizational goals

without considering the impact on other organizational units. For example, a purchasing manager might sacrifice quality for price without considering that the quality of incoming materials adversely affects production efficiencies and customer satisfaction.

2. *Requires costly coordination of decisions.* Effective decision making in decentralized organizations requires careful coordination of the decisions by managers at various levels. Having proper internal information systems such as networked computers and other formal coordination mechanisms such as weekly meetings is important to ensure that all managers work toward the same organizational goals. The costs of coordination increase with an organization's size and complexity.
3. *Triggers improper decisions because of the divergence between individual and organizational goals.* As we learned in Chapter 1, divergence of individual goals from organizational goals means that managers might pursue their own objectives instead of acting in the organization's best interests. Decentralization worsens this problem by giving control over organizational resources to lower-level managers who are far-removed from the top management/owners of the firm.

A major part of top management's responsibility is to figure out how to maximize the benefits and minimize the costs associated with decentralization. We can increase benefits by carefully identifying the decisions under each manager's purview, matching the scope of decisions with the manager's skills and knowledge. We can also help lower-level managers understand the firm's strategy, values, and goals.

It is not possible to completely eliminate the costs of delegating decisions. Accordingly, as we discussed in Chapter 1, organizations use monitoring, performance evaluation, and incentive schemes to manage these costs. Because planning and control go hand-in-hand, the choice of which measures to use depends on the extent of decentralization and the coordination systems in place. Overall, decisions concerning how much to decentralize, the performance measures to use, and the incentive systems to employ are among the most complex decisions in organizations.

RESPONSIBILITY CENTERS

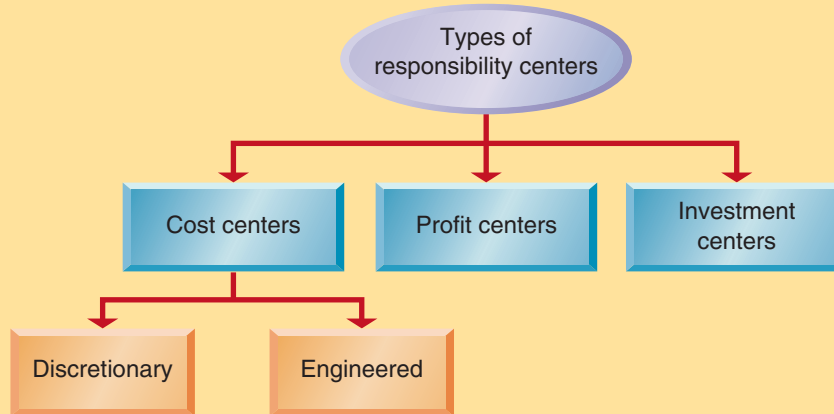
Building on our discussion in Chapter 7 and as shown in Exhibit 12.3, let us consider in detail the three common forms of **responsibility centers** listed below. Each of these organizational subunits corresponds to the nature of decisions made by the managers of the subunit.

- Cost centers
- Profit centers
- Investment centers

Let us now review the decision rights delegated to each type of responsibility center. In this review, we focus on the first issue of how to pick performance measures for each kind of responsibility center. We address the second issue, transfer pricing, later in the chapter.

Cost Centers

Cost center managers exercise control over costs, but not revenues and investments. Their charge is to *minimize the cost of producing a specified level of output or the cost of delivering a specified level of service*. The objective of cost center managers is to improve the *efficiency* of operations by finding ways to cut costs and minimize waste. Examples

Exhibit 12.3 *There Are Several Kinds of Responsibility Centers*

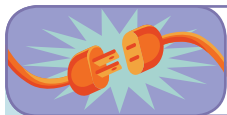
Issue 1: Pick performance measure for each kind of responsibility center.

Issue 2: Pick prices to account for transfers among divisions.

of cost centers include departments such as plant maintenance, data processing, human resources, production, and general administration. We could also consider departments such as machining and assembly, both of which are involved in making product, as cost centers. In KCPC, copy operations and PC operations in each location are cost centers.

Profit Centers

Profit center managers focus on profit. Their goal is to *both minimize costs and to maximize revenues*. KCPC's operations in each of the three regions are profit centers. Other examples include individual product lines in firms such as **Procter and Gamble** and retail stores of firms such as **Sears**.



Connecting to Practice

ORGANIZATION STRUCTURE AT JOHN DEERE

John Deere, a FORTUNE 500 firm, operates worldwide in many product markets. **John Deere** has several manufacturing divisions organized along product lines. These divisions focus on producing agricultural equipment, commercial and consumer equipment, power systems, and construction and forestry equipment. In addition, **John Deere** also operates a health maintenance organization, as well as **John Deere Credit**.

COMMENTARY: **John Deere** could instead have organized itself along geographic lines. However, its focus on excellence in manufacturing probably influenced management to enter into a product-oriented organization. The credit division supports the other divisions by providing financing to farmers and others. The health division began as a service to employees.



Large firms such as Deere & Co. have complex organization structures. (David R. Frazier/Danita Delimont Agency/Digital Railroad, Inc.)

Investment Centers

Managers of investment centers make decisions that influence costs, revenues, and investments. Their mandate is to *maximize the returns from invested capital, or to put the capital invested by owners and shareholders of their organizations to the most profitable use*. Examples of investment centers include large independent divisions in organizations such as **Sony**, **Siemens**, **Microsoft**, and **Procter and Gamble**. In the case of KCPC, the only individual with control over investments is Aaron, as he has not delegated this authority to any of his managers.

As shown in Exhibit 12.3, organizations need effective performance measurement systems to evaluate the decisions of various responsibility centers and to set appropriate incentives for their managers. Indeed, Aaron's problem at KCPC is the lack of such a system. *What should Aaron measure to evaluate performance? How should he measure the chosen items? How should he use these measures in incentive contracts?* Let us address these questions next.

Principles of Performance Measurement

LEARNING OBJECTIVE 2

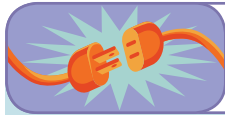
Apply the principles of performance measurement.

A **controllable performance measure** reflects the consequences of the actions taken by the decision maker. Intuition suggests that we hold decision makers accountable only for costs and benefits that they can control—that is, costs and benefits that change because of their actions. Thus, we should hold a production manager accountable for production delays but not for the overall volume of production. *Marketing* managers have the authority to change prices and offer promotions that affect actual sales, which determine the required production. *Production* managers, therefore, have little control over the volume of production. It is not reasonable to hold them accountable for someone else's decisions or random market conditions. Likewise, the manager of a restaurant in a beach resort can do little to avoid losses due to a hurricane.

While intuitive, the controllability principle is not always the right approach for choosing performance measures. Instead, we should rely on the **informativeness principle**. A performance measure is *informative* if it provides information about a manager's effort, even if the manager does not have control over it.

Most controllable measures are informative. Students control their performance on a quiz, and their score is informative about their grasp of the subject matter. However, an informative measure is not necessarily controllable. Consider the practice of grading on a curve, in which a student's grade also reflects overall class performance. What does this relative grading accomplish? Well, it controls for the level of difficulty of the exam. In an exam where the top score is 70 out of 100, a score of 69 is a high mark. An individual student has little control over how the rest of the class performs. Yet, the overall class performance is useful information in evaluating each individual student's performance because it tells us how hard the exam is.

This example extends readily to business settings. If a firm incurs losses when other firms in the industry are highly profitable, we may attribute those losses to poor managerial performance. However, if other firms in the industry are doing even worse, then the firm's management may actually be doing a terrific job of dealing with adverse business conditions. Thus, evaluating a firm relative to other firms in the industry, or **relative performance evaluation**, is useful, even though the firm's managers may have little control over how other firms do.



Connecting to Practice

MUTUAL FUNDS AND RELATIVE PERFORMANCE EVALUATION

Several publications such as *Business Week* and the *Wall Street Journal*, as well as ratings firms such as **Morningstar**, evaluate the managers of mutual funds. Inevitably, these services rank a manager's performance relative to a comparison group. The *Wall Street Journal* ranks mutual funds into quintiles, or fifths. Only the top funds receive the coveted 5-star rating from **Morningstar**.

COMMENTARY: Investors in mutual funds pay managers for delivering *market-beating* returns, as investors can obtain the market return with little effort. Thus, the return in the appropriate sector (domestic, international) is the natural benchmark for performance evaluation, even though the mutual fund manager exerts no influence over market returns.

CHARACTERISTICS OF EFFECTIVE PERFORMANCE MEASURES

An ideal performance measure:

- *Aligns employee and organizational goals.*
- *Yields maximum information about the decisions or actions of the individual or organizational unit.*
- *Is easy to measure.*
- *Is easy to understand and communicate.*

A single performance measure rarely possesses *all* of these characteristics. Rewarding employees based on customer satisfaction can help align organizational and employee goals. The measure motivates employees to pay attention to customers, and happy customers are the sources of future profit. But, customer satisfaction is subjective and difficult to measure. Some school districts rely heavily on objective test scores to evaluate the performance of their employees (such as grade school teachers). These scores might divert employees' attention from building other important skills such as creative thinking, which are hard to measure. To make effective trade-offs among the attributes, organizations often use a combination of performance measures. Let us apply these principles to KCPC and select performance measures for its cost and profit centers.

Evaluating Cost and Profit Centers

Cost center managers serve two roles in organizations: achieving cost targets for a given level of output in the short term, and making continuous efficiency improvements to cut costs in the long term.

In the short term, organizations typically use budget variances to measure cost center performance. Recall from Chapter 7 that operating budgets specify the resources needed to achieve a targeted level of output or service for the plan period.

LEARNING OBJECTIVE 3

Rate the performance of cost and profit centers.

The budget makes assumptions about materials usage and prices to determine the expected quantities of raw materials and their costs. In Chapter 8, we examined the role of flexible budgets. We analyzed flexible budget variances to evaluate performance during a budget period. For example, we can employ usage variances to evaluate the Production Department and raw material price variances to evaluate the purchasing function.

Ever since Aaron began KCPC, he has followed a practice of making detailed budgets for each branch. These budgets specify expected sales volume by product and the costs of providing the requisite service. At the end of each week, Aaron performs a variance analysis, by branch, to highlight problem areas and institute immediate corrective action.

Long-term Measures

To achieve long-term reductions in cost, organizations use performance measures arising from techniques such as benchmarking and kaizen.

- **Benchmarking** is a process that involves comparing the effectiveness and efficiency of various activities and business processes in a firm against the best practices in the industry. Such best practices are not controllable by the decision maker but still are useful performance measures. For example, a firm may hold a manager accountable for achieving greater reductions in cycle time than attained by immediate competitors.
- **Kaizen** is a philosophy of continuous improvement. This initiative encourages and rewards employees who constantly seek and suggest improvements to activities and business processes. One way to implement continuous improvement is to hold managers accountable for achieving *permanent* cost reductions.

Within KCPC, Aaron has tried to instill a spirit of continuous improvement. He routinely benchmarks the costs in one branch versus the others. If a branch consistently turns in a poor performance, Aaron steps in to help the manager find ways to reduce costs. Each month, Aaron also recognizes the employee with the “best cost saving idea for the month,” and implements the idea in all branches. On an inflation-adjusted basis, his goal is to obtain a 5% reduction in overall costs each year.

Discretionary Cost Centers

The above discussion focuses on evaluating cost centers for which there is a clear relation between inputs and outputs. Such centers are termed **engineered cost centers**. However, many managers oversee **discretionary cost centers** where measuring output can be difficult. For example, members of the corporate legal staff guide and counsel management, but their output is intangible as it pertains to the quality of corporate decisions. Because there is no obvious relation between inputs and outputs in discretionary cost centers, the concerned managers’ evaluation is primarily subjective. Often, the manager is required to operate within a fixed budget set at top management’s discretion. The manager also is responsible for meeting qualitative targets, such as promptness in responding to inquiries or anticipating and heading off problems.

Being relatively small, KCPC does not have many discretionary cost centers. Aaron has outsourced most services such as accounting, advertising, IT support, and legal. Periodically, he evaluates the efficiency and effectiveness of the purchased services by obtaining competing price quotes and querying his managers about their satisfaction with the level of service.

PERFORMANCE EVALUATION IN PROFIT CENTERS

The goal of a profit center manager is to maximize profit, either by increasing revenues or decreasing costs, or both. Like KCPC, most large organizations treat geographically dispersed locations (or segments) as profit centers. Many corporations

such as **Microsoft** also form divisions along product lines. Some organizations such as **Citigroup** and **Wipro** form complex matrix structures, where they measure profit both by region and by product.

Firms often use *profit before taxes* to evaluate profit centers, computed as:

$$\begin{aligned} \text{Profit before Taxes} &= \text{Revenue} - \text{variable costs} - \text{traceable fixed costs} \\ &= \text{Contribution margin} - \text{traceable fixed costs} \end{aligned}$$

Exhibit 12.4 presents a contribution margin statement for KCPC. Aaron evaluates the three regions as profit centers. For the most recent year, the operating profits for these three locations are \$1,277,000, \$721,832, and \$751,408, respectively.

Just as budgets provide a natural benchmark for evaluating cost center performance, they also provide a natural benchmark for profit centers. Firms use the master budget as the benchmark because a profit center manager has decision rights over both outputs and inputs.

Firms often compare actual profit with past profit and with industry profit. Retail stores such as **Target** routinely track growth in same-store sales. Using past performance is of particular importance in organizations following a growth-oriented strategy. Likewise, using industry performance as the benchmark allows the firm to control for industry conditions that are outside its control.

Aaron uses past performance to analyze the three profit centers of KCPC. Exhibit 12.5 provides the analysis for Westchester. Note that Westchester's actual revenue is 13.9% short of budget and is almost 5% lower than prior year actual. Despite this revenue shortfall, variable costs have increased relative to last year, both in absolute terms and relative to revenue. Naturally, the contribution margin is substantially lower. As discussed earlier, Aaron could use profit variance analysis to disentangle

Exhibit 12.4 <i>Knight Copy & PC Center: Divisional Income Statements</i>				
	New York	Westchester	New Jersey	Total
Revenue	\$5,850,000	\$4,520,400	\$4,880,000	\$15,250,400
Variable costs	(2,223,000)	(1,898,568)	(1,978,592)	(6,100,160)
Contribution margin	\$3,627,000	\$2,621,832	\$2,901,408	\$9,150,240
Traceable fixed costs	(2,350,000)	(1,900,000)	(2,150,000)	(6,400,000)
Division profit before taxes (Segment margin)	\$1,277,000	\$721,832	\$751,408	\$2,750,240
Common (corporate) fixed costs				(\$750,000)
Profit before taxes				\$2,000,240

Exhibit 12.5 <i>Knight Copy & PC Center: Profit Variance Report (Westchester)</i>					
	Actual	Benchmark		Variance from	
		Budget	Last year	Budget	Last year
Revenue	\$4,520,400	\$5,250,000	\$4,752,540	13.90% U	4.88% U
Variable costs	1,898,568	1,942,500	1,805,965	2.26% F	5.13% U
Contribution margin	\$2,621,832	\$3,307,500	\$2,946,575	20.73% U	11.02% U
Fixed costs	1,900,000	2,000,000	1,875,415	5.00% F	1.31% U
Segment margin	\$ 721,832	\$1,307,500	\$1,071,160	44.79% U	32.61% U



CHAPTER CONNECTIONS

We revisit the issue of motivating long-term action in Chapter 13, where we discuss the Balanced Scorecard (BSC), a technique for picking performance measures that match the organization's strategy. The Balanced Scorecard emphasizes the use of both lead and lag performance measures.

the effects of these various factors on the profit shortfall and to isolate controllable deviations from those that are not controllable.

Increasingly, firms measure profit center managers' ability to meet long-term goals in addition to delivering the operating profit budgeted for the current period. Revenue-oriented measures include customer satisfaction and market share. Cost-oriented measures might focus on employee turnover or the number of process improvements. Measuring performance using these *lead* indicators ensures that profit center managers do not sacrifice future profit for current profit.

Having discussed performance measurement in cost and profit centers, let us now consider the choice of performance measures for evaluating investment centers and their managers.

Performance Measurement in Investment Centers

LEARNING OBJECTIVE 4

Evaluate the performance of investment centers.

Managers of investment centers enjoy considerable autonomy in decentralized organizations. Firms often view investment centers as a stand-alone business. Divisions of **General Motors**, such as Cadillac, Pontiac, and Saturn, are investment centers. These divisions even compete with each other in the market for automobiles. Other firms, such as **Johnson & Johnson**, also consist of many independent divisions. In such companies, the head office typically sets business priorities, provides strategic direction, allocates investment funds, and monitors the performance of its divisions.

An organization evaluates an investment center on how well it utilizes the funds made available to it. Three popular measures of investment center performance are *return on investment (ROI)*, *residual income (RI)*, and *economic value added (EVA)*. Firms use these measures to evaluate whether the investment center manager is meeting or exceeding performance expectations, and to allocate available funds to divisions in the most profitable manner.

RETURN ON INVESTMENT

Return on investment (ROI) is a measure of the profit generated per dollar of investment, calculated as

$$\text{ROI} = \frac{\text{Profit}}{\text{Investment}}$$

An investment center's profit results from its operations. Just as with profit centers, the profit we compute includes all revenue and expense items directly related to the center's operations. Normally, we exclude *interest and taxes* from the calculation because investment center managers usually do not influence financing or

tax-related decisions. However, if a division controls short-term working capital financing, such as short-term bank loans, then we would include the cost of such short-term financing. We would include taxes only if the division's choices significantly influence the corporate tax burden.

Assets that contribute to the operations of the division include fixed assets such as plant and equipment, and current assets such as cash, inventories, and accounts receivable. We do not include assets such as marketable securities and land; the corporate office usually manages these items. Most firms use the average operating assets as a measure of invested capital. This measure equals the average of the beginning and ending value of operating assets for the period (i.e., year of evaluation).

An important issue in measuring divisional investment is how to incorporate depreciable fixed assets such as plant and equipment. Three options exist:

1. *Net book value:* Net book value is the original acquisition cost of plant and equipment less accumulated depreciation. This method is consistent with the computation of operating profit (as we include depreciation of plant and equipment in computing profit). However, the asset's age becomes a factor. As the asset becomes older, the accumulated depreciation increases and the net book value decreases. Consequently, ROI often is higher for older assets. As a result, managers may have less of an incentive to undertake timely asset replacement decisions. Net book value is, by far, the measure most commonly used to compute ROI.
2. *Gross book value:* Gross book value is the original acquisition cost. As this measure does not include depreciation charges, the asset's age is less of a factor. However, because gross book value fails to measure the change in the value of the investment with the passage of time, it fails to represent the "true" investment of the company at the time of the evaluation.
3. *Replacement or current value of the asset:* This measure of investment is more likely to represent the true value of the asset. However, identifying the replacement costs, or current value, of various assets can be difficult and tedious.

Aaron computes ROI using net book value. As Exhibit 12.6 shows, the ROI for Manhattan is 16%, compared to less than 8% for Westchester and New Jersey. We obtain the divisional profit numbers from Exhibit 12.4.

Exhibit 12.6 <i>Knight Copy & PC Center: Return on Investment Calculations</i>				
	Manhattan	Westchester	New Jersey	Total
Divisional profit	\$1,277,000	\$721,832	\$751,408	\$2,750,240
Original acquisition cost of assets	\$10,000,000	\$10,000,000	\$10,000,000	\$30,000,000
Accumulated depreciation (average)	\$3,000,000	\$1,500,000	\$1,500,000	\$6,000,000
Net book value (average)	\$7,000,000	\$8,500,000	\$8,500,000	\$24,000,000
Other operating investments (average)	1,200,000	1,500,000	1,500,000	4,200,000
Average Investment	\$8,200,000	\$10,000,000	\$10,000,000	\$28,200,000
ROI (Net book value method)				
Divisional profit	\$1,277,000	\$721,832	\$751,408	\$2,750,240
Divisional investment	\$8,200,000	\$10,000,000	\$10,000,000	\$28,200,000
ROI	16%	7%	8%	10%



Check It! Exercise #1

Use the information below to verify that the average investment of KCPC's Manhattan division was \$8,200,000 for the most recent year.

Net book value of assets,		
January 1	\$7,150,000	(1)
New investments in assets	\$250,000	(2)
Net book value of assets,		
December 31	\$6,850,000	(3)
Average book value of assets	_____	(4) = ((1) + (3))/2
Other operating investments,	\$1,100,000	(5)
January 1		
Other operating investments,		
December 31	\$1,300,000	(6)
Other operating investments,		
average	_____	(7) = ((5) + (6))/2
Average investment	_____	(8) = (4) + (7)
Depreciation for the year	_____	(1) + (2) - (3)

Solution at end of chapter.

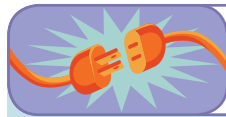
Advantages and Disadvantages of ROI

Surveys show that over 90% of firms use some version of ROI in their performance measurement systems. This is because ROI is an effective summary measure of business profitability. We could evaluate investments by comparing their ROIs with those of similar investments in the past, as well as the experiences of other firms in the industry. Many organizations also use ROI because it controls for size by expressing the return per investment dollar. Consequently, it is easy to compare the performance of investment centers of different size. Finally, as we show next, we can decompose ROI into smaller pieces, allowing managers to see how individual actions map into overall profitability.

The major criticism against ROI is that it fosters underinvestment. By focusing on current income and investment, ROI ignores future period considerations, making it less suitable for evaluating long-term performance. Managers would find actions that generate immediate income more desirable than actions that generate income in some future period, even though the latter actions may be more beneficial from the company's standpoint.

For example, consider a firm whose opportunity cost of capital is 15%. Suppose a division in this firm is currently generating an ROI of 22%. Finally, assume that this division has a new investment opportunity that promises an ROI of 20%. This investment opportunity is attractive for the firm because it promises an ROI greater than 15%. Yet, the manager of the division might decline this investment. Why? Because the division's ROI is greater than the investment's ROI, adopting it will lower the division's ROI and potentially reduce the manager's compensation. In practice, firms reduce the negative impact of ROI by carefully defining their measurement of ROI. Using a suitable benchmark such as budgeted ROI can help reduce the effect of measurement problems.

For KCPC, the three divisions are profit centers, not investment centers. The managers of these divisions are not concerned with ROI because it is not the basis for evaluating their performance. However, from Aaron's viewpoint, ROI is useful in evaluating how his investments in the three locations are performing. Notice that Aaron could decentralize further by treating the three locations as investment centers. However, further decentralization might not be appropriate for this relatively small, geographically focused, single-business firm.



Connecting to Practice

ROI AND INFORMATION TECHNOLOGY

A recent survey of technology executives by *InformationWeek* magazine reports that fully 80% of organizations aim to improve their return on information technology (IT) expenses. Such focus occurs because IT spending is increasing by 10% or more a year. Moreover, the industry research firm **Gartner** reports that \$500 billion of the \$2.7 trillion spent on IT in 2001 did not meet objectives.

COMMENTARY: Evaluating the ROI of a support service, such as IT, is difficult. Nevertheless, firms need to quantify the total benefits from IT and to use financial return as a key criterion when making decisions regarding spending on IT. A study by **Unisys Corporation** shows surprising consistency in whether firms get stellar, mediocre, or negative ROI on their IT expenses. The study also shows that successful firms spend a great deal of effort in picking the right metrics and in building a culture of getting the most out of IT expenses.

Source: Martha Heller, "The ROI of IT," *CIO magazine*, December 27, 2000.

Decomposing Return on Investment

The **DuPont model**, so named for the firm that pioneered this kind of analysis, is a method for decomposing ROI into smaller pieces.

$$\text{ROI} = \frac{\text{Profit}}{\text{Investment}} = \frac{\text{Profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Investment}} = \text{Profit Margin} \times \text{Asset Turnover}$$

In turn, we can express profit margin as

$$\text{Profit Margin} = \frac{\text{Profit}}{\text{Sales}} = \frac{\text{Sales} - \text{Operating expenses}}{\text{Sales}} = 1 - \frac{\text{Operating expenses}}{\text{Sales}}$$

Profit margin increases if operating expenses per sales dollar decreases. In other words, if a division can generate the same amount of sales with less operating expenses or more sales with the same operating expenses, its profit margin will increase. Therefore, managers can increase profitability by *cost control* or by making operations more *efficient*.

Asset turnover (sales/investment) is a measure of the *revenue-generating ability* of operating assets. A company wants a higher turnover. It indicates that for a given level of investment in operating assets, the company is able to generate a higher level of revenues. Asset turnover increases by increasing revenue with the same level of assets or by decreasing the level of investment required for the same level of revenue.

Exhibit 12.7 shows the DuPont analysis for the three divisions of KCPC.

Exhibit 12.7 *Knight Copy & PC Center: DuPont Analysis*

Divisions	Revenue	Operating Expenses	Operating Profit	Profit Margin	Divisional Investment	Asset Turnover	ROI
New York	\$5,850,000	\$4,573,000	\$1,277,000	22%	\$8,200,000	0.71	16%
Westchester	\$4,520,400	\$3,798,568	\$721,832	16%	\$10,000,000	0.45	7%
New Jersey	\$4,880,000	\$4,128,592	\$751,408	15%	\$10,000,000	0.49	8%

 **Check It! Exercise #2**

Given the following information, compute the ROI of KCPC's Westchester division. (Note that these data differ from those in Exhibit 12.6.)

Divisional investment	\$8,000,000
Sales of Westchester division	\$6,400,000
Operating profit	\$800,000
Asset turnover (sales/investment)	_____
Profit margin (operating profit/sales)	_____
ROI (asset turnover × profit margin)	_____

Solution at end of chapter.

How could Aaron improve KCPC's ROI? Assume the Westchester division can decrease its variable operating expenses from \$0.42 per sales dollar to \$0.40 per sales dollar. The level of revenue, fixed costs, and investment in place would remain the same. In this case, asset turnover will not change—it will remain at 0.45. However, the profit margin would increase from the current level of 16% to 18% as calculated in the following:

$$[\$4,520,400 - (\$4,520,400 \times \$0.40) - \$1,900,000] / \$4,520,400 = 18\%$$

Thus, ROI will increase from 7% to $(18\% \times 0.45) = 8\%$. We could also compute the effect on asset turnover, profit margin, and ROI for other changes that Aaron might implement, such as selling off or acquiring assets. Exhibit 12.8 illustrates these effects.

RESIDUAL INCOME

Because of the limitations of ROI discussed in the preceding sections, some firms use **residual income (RI)**. Residual income is the amount an investment generates above and beyond the required rate of return on operating assets, or the residual after subtracting the expected return.

$$\text{Residual income (RI)} = \text{Profit} - (\text{Required Return} * \text{Investment})$$

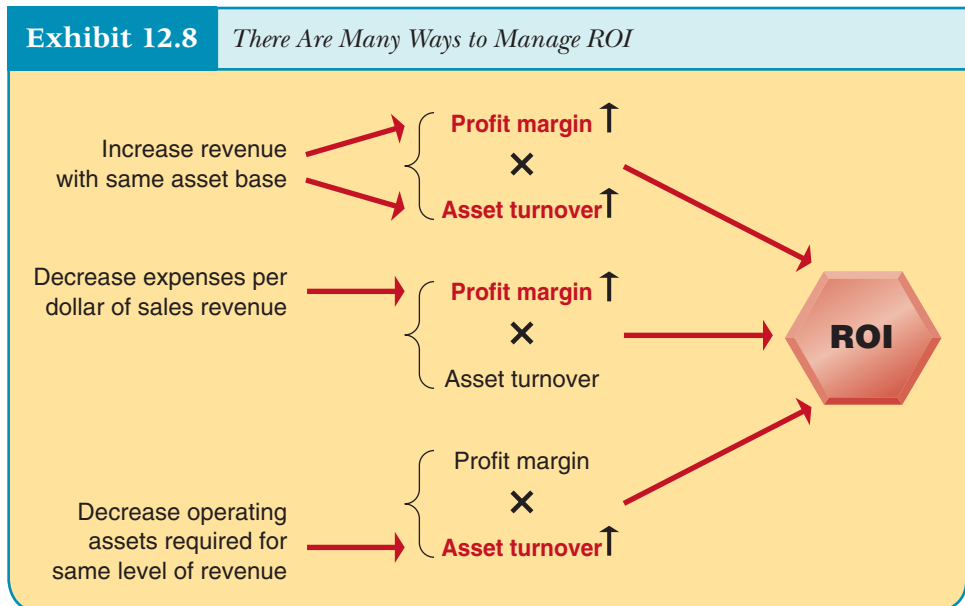


Exhibit 12.9*Knight Copy & PC Center: Residual Income Analysis (Required Rate of Return = 10%)*

Division	Revenue	Operating Expenses	Operating Profit	Divisional Investment	RI
Manhattan	\$5,850,000	\$4,512,500	\$1,337,500	\$8,200,000	\$517,500
Westchester	\$4,520,400	\$3,798,568	\$721,832	\$10,000,000	−\$278,168
New Jersey	\$4,880,000	\$4,128,592	\$751,408	\$10,000,000	−\$248,592

Exhibit 12.10*Project Evaluation with ROI and RI*

Current	Investment	Profit
Current operations	\$100,000	\$22,000
Proposed project	\$40,000	\$8,000
Analysis from corporate viewpoint		
ROI of new project	\$8,000/\$40,000	20%
Cost of capital		15%
Decision		ACCEPT
Analysis with Return on Investment (Divisional viewpoint)		
Current ROI	\$22,000/\$100,000	22%
ROI with proposed project	\$30,000/\$140,000	21.42%
Decision		REJECT!
Analysis with Residual Income (Divisional viewpoint)		
Current ROI	$\$22,000 - (0.15 \times \$100,000)$	\$7,000
ROI with proposed project	$\$30,000 - (0.15 \times \$140,000)$	\$9,000
Decision		ACCEPT

Exhibit 12.9 calculates the residual income of KCPC's three divisions using 10% as the minimum required rate of return. Only the Manhattan division generates positive residual income, while the other two divisions have negative residual income.

Residual income represents the additional profit or value generated by an investment after meeting the required rate of return. It does not lead to underinvestment because any project with positive NPV has positive residual income, making it attractive to the manager. Exhibit 12.10 provides a numerical example of this advantage of RI as a performance measure.

Despite its conceptual advantage, RI has two key limitations that have reduced its use within modern corporations. First, the magnitude of RI depends on the size of the investment. For example, when two divisions have identical profitability (ROI), then the larger of the two would report a higher RI. Consequently, when ranking potential investment proposals, ROI and RI can yield conflicting rankings. Second, RI rankings depend crucially on the chosen rate of return. It is easy to construct examples in which the rankings of divisions using RI changes if we change the required rate of return. Exercises 12.40 and 12.41 allow you to verify these concepts.

ECONOMIC VALUE ADDED

In recent years, a modified calculation of the residual income has gained popularity among organizations. **Economic value added (EVA)** is a measure developed and popularized by a consulting firm, Stern Stewart & Company. Although similar to



CHAPTER CONNECTIONS

Estimating the risk-adjusted WACC for individual divisions is a difficult exercise. As we detail in Chapter 13, the firm is the unit of analysis for raising capital, but the division is the unit of analysis for allocating capital. Additional complications arise in international settings because divisions may operate in different tax jurisdictions.

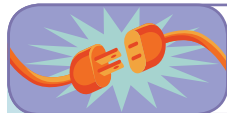
residual income, EVA reflects the belief that managers are responsible for covering both the operating *and* capital costs of a business, including taxes. We calculate EVA as

$$\text{EVA} = \text{NOPAT} - [\text{WACC} \times (\text{Invested Capital} - \text{Current Liabilities})]$$

where NOPAT is the net operating profit after taxes and WACC is the weighted average cost of capital.

While the formula for calculating EVA appears simple, the actual calculations are quite involved. Calculating NOPAT requires a number of adjustments to the income reported in financial statements. In essence, these adjustments “undo” the impact of many accounting rules used to prepare the financial statements. EVA computations also specify how to measure the weighted average cost of capital and the investment base.

One example of adjustments to NOPAT relates to research and development expenditures. Generally Accepted Accounting Principles (GAAP) require that research and development costs be expensed for financial reporting purposes. However, EVA computations treat these expenses in much the same way as investments in long-lived assets such as property, plant, and equipment. The proponents of EVA argue that expensing research and development costs reduces NOPAT, which will adversely affect EVA. As a result, managers will be reluctant to undertake



Connecting to Practice

EVA AND THE CHEMICAL INDUSTRY

From 1997 to 1999, **Dow Chemical**'s sales declined 5.4%, earnings before interest and taxes (EBIT) were down 23.5%, and earnings per share (EPS) fell from \$7.70 to \$5.93. While each of these measures signaled a downturn and poor financial performance, what happened to the *value* of the company?

COMMENTARY: Commenting on 1999 financial results, William Stavropoulos, former president and CEO of **Dow Chemical Company**, says, “In what may well have been the bottom of the industry pricing cycle, our company surpassed a key financial milestone we set five years ago, earning a return well above our cost of capital—something we had never done in a trough year.” That is, **Dow** created positive EVA in each of those years. Not surprisingly, the firm's market *value* increased by over 17% during this period.

Source: EVA and the Chemical Industry: How Do Companies Rank? John Ballow, Henri Perrson, and Fred Knechtel, *Chemical Market Reporter*, 7, Vol. 260, Issue 9, September 3, 2001.



Check It! Exercise #3

Calculate economic value added (EVA) using the following information. Notice that a larger NOPAT does not necessarily result in a larger EVA.

	<u>Scenario 1</u>	<u>Scenario 2</u>
Net operating income after taxes (NOPAT)	\$1,405,600	\$756,000
Invested capital	\$10,450,000	\$3,500,000
Current liabilities	\$245,000	\$650,000
Weighted average cost of capital	18%	18%
Economic value added	_____	_____

Solution at end of chapter.

valuable R&D activities. Capitalizing research and development costs, and expensing them gradually over time, better reflects the fact that R&D provides benefits for many years.

We illustrate EVA calculations using a numerical example in the self-study problem at the end of the chapter.

MEASURING LONG-TERM PERFORMANCE

While useful for measuring investment center performance, it is important to recognize that ROI, EVA, and RI all focus on the short term. These measures consider current period profit and current investment. Moreover, these are lag measures, reflecting the outcomes of past decisions.

Recognizing these limitations, many firms complement ROI, RI, and EVA with other measures that have a longer-term focus, such as market share, customer satisfaction, or growth in new product sales. These measures provide information on the

APPLYING THE DECISION FRAMEWORK

What Is the Problem?	Aaron is worried about the performance of KCPC's branch offices and the commitment of its managers.
What Are the Options?	Aaron has numerous options for clearly defining each manager's role and for putting in a performance measurement and evaluation system that monitors each manager's actions.
What Are the Costs and Benefits?	Performance measures and incentive schemes help Aaron reduce the agency loss due to decentralization. However, devising, computing, and analyzing a portfolio of measures is costly in terms of managerial time. Moreover, these measures imperfectly align employee goals with KCPC's goals, meaning that there would still be some agency loss.
Make the Decision!	At the aggregate level, Aaron plans to compute the ROI and EVA for each branch to help with investment decisions. Budgets, supplemented with variance analysis, form the basis for branch manager evaluation. Aaron plans to use relative performance evaluation to determine cost targets. Aaron also decides to share the DuPont analysis with his managers and to set specific targets for improving profitability. Finally, Aaron decides to implement some nonfinancial measures to provide incentives to maximize long-term profitability.

expected long-term outcomes of current period actions. Thus, using ROI, RI, or EVA in conjunction with long-term performance measures can help in setting the right incentives for management. We discuss these long-term performance measures, such as the balanced scorecard, in Chapter 13.

So where does all this information leave Aaron? At the overall company level, Aaron decides to add EVA to ROI as a measure of divisional performance. For individual branches, he decides to pay increased attention to setting budget targets and using variances to identify any budget deviations. He also sets up nonfinancial measures such as sales targets for product lines, average wait times, and the number of new corporate accounts for continued growth. Using the fact that all branches employ similar technology, Aaron decides to use the average cost realized by the top quartile of branches for cost benchmarks. Finally, he decides to set up incentive schemes that better align the interests of his managers with KCPC.

Transfer Pricing

LEARNING OBJECTIVE 5

Describe transfer pricing.

We next turn our attention to another important issue in decentralized organizations, noted in Exhibit 12.3. The multiple divisions found within many organizations often deal with each other in the normal course of business. In such instances, the divisions divert a portion of their resources from external business to serve internal needs. Consequently, performance measurement at the divisional level will not be complete without incorporating the costs and benefits of these internal transactions.

We commonly see *intra-company*, or internal, business transactions in which an organization transfers goods or services among its divisions or segments. For example, **John Deere**'s tractor assembly division uses parts supplied by the firm's components division. Similarly, **Georgia Pacific**'s forest products division supplies the paper used by the company's paper division. Companies usually cite increased efficiency or a synergy in operations as the reasons for such integration.

When intra-company transfers occur, no legally recognized sale takes place because the divisions are part of the same company. Usually, no cash changes hands as well. Nevertheless, firms still recognize the economic effects of the transaction by using a **transfer price** to record a "sale" by the selling division and a "purchase" by the buying division.

DEMAND FOR TRANSFER PRICES

From the perspective of determining corporate *pretax* income, a transfer price does not serve any useful purpose. After all, the price increases the revenue of the selling division and the costs of the buying division by the same amount. These entries cancel each other out when the firm consolidates divisional operations to determine corporate profit. Exhibit 12.11 underscores this observation. It provides an example of the flow of revenue and costs in a typical transfer-pricing setting. In this example, the firm includes the transfer, valued at \$1,640,000, as revenue for the selling division and as a cost for the buying division. This offset means that the transfer does not affect the consolidated total in any way.

Why, then, do we need a transfer price? The demand for a transfer price does not stem from decisions based on corporate profit. Instead it comes from decisions that are based on the profit reported by individual divisions. Not attaching a value to the internal transfer of goods and services increases the buying division's profit because the buying division does not pay anything for the goods and services

Exhibit 12.11 *Accounting for Internal Transfers*

	Selling Division	Buying Division	Total (after eliminating intra firm transfers)
Revenue—External	\$3,000,000	\$2,450,000	\$5,450,000
Revenue—Internal	1,640,000	0	
Total Sales	\$4,640,000	\$2,450,000	\$5,450,000
Variable costs	1,700,000	450,000	2,150,000
Purchases—Internal	0	1,640,000	
Contribution margin	\$2,940,000	360,000	\$3,300,000
Segment fixed costs	1,500,000	200,000	1,700,000
Segment margin	\$1,440,000	\$160,000	\$1,600,000
Corporate fixed costs			1,278,000
Profit before taxes			\$322,000

received. However, it decreases the selling division's profit because the selling division does not receive any consideration. In contrast, a well-set transfer price allows firms to measure the true profit earned by divisions. This measure can then be used for decisions about resource allocation and performance evaluation. In addition, divisional managers have a keen interest in the transfer price because their individual compensation often depends on the profit reported by their division.

Tax authorities are also concerned about transfer prices. To see why, consider a firm whose divisions transfer goods and services among themselves but who operate in different tax jurisdictions. Transfer prices determine the income reported by each division and, thus, the taxes paid to different jurisdictions. Naturally, firms seek to set prices that will reduce the overall corporate tax burden. Recognizing these incentives, government agencies such as the **Internal Revenue Service** devote considerable effort to formulating and enforcing policies that ensure firms recognize and pay taxes on appropriate income in their country or jurisdiction.

CONFLICT IN SETTING TRANSFER PRICES

Setting effective transfer prices is difficult because the buying and selling divisions often do not agree on what constitutes a fair price. A transfer price determines what portion of the assessed value of the interdivisional transaction each division gets to keep. A low transfer price benefits the buying division, but the selling division suffers. A high transfer price has the opposite effect. A natural conflict arises because both of the divisions are profit centers. Therefore, they are interested in maximizing their respective divisional profits.

Why can't top management solve the problem by combining the divisions as a way of preserving cooperation? This solution frequently is not feasible because of strategic and economic considerations. For example, **Georgia Pacific** might wish to evaluate its forest products division separately from the paper division because their business models differ—that is, **Georgia Pacific's** top management has decided to decentralize the two divisions.

Furthermore, top management cannot step in and solve transfer-pricing disputes among its subordinates. Such a strategy might not work well for at least two reasons. First, the head office may not have the knowledge required to determine the best transfer price, which depends on the opportunity costs for each division. Second, such intervention undermines the benefits of decentralization and delegated decisions. If a division consistently makes bad decisions, the results will eventually reduce

its profit and rate of return. The divisional manager then becomes accountable. A firm should respect the manager's right to make the wrong call. Even if the profit may suffer as a result in the short term, preserving divisional autonomy is likely to lead to greater profitability in the long term. Although the temptation to intervene might be strong at times, head office managers should exercise caution and judgment before stepping in to mediate a transfer-pricing dispute.

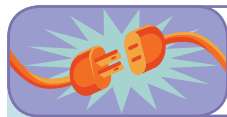
PRACTICE PATTERNS

Most companies issue guidelines for setting transfer prices. However, they usually give some autonomy to the division managers to negotiate the final terms. Some common approaches include:

1. Cost-based transfer prices (including variable and full cost)
2. Market-based transfer prices
3. Negotiated transfer prices

Variable cost-based transfer pricing is most appropriate for a short-term problem in which the selling division has excess capacity. In this context, the rule makes sense because the opportunity cost of idle capacity is zero. When the selling division has enough demand, the opportunity cost of its capacity is not zero, and its manager often will not agree to a variable cost-based transfer price unless there is a sufficiently high markup. Full cost-based pricing is more justifiable with full capacity utilization because full cost includes allocated capacity cost.

In general, there is no guarantee that cost-based transfer prices will lead to the right quantity of transfers taking place. In other words, there is no guarantee



Connecting to Practice

TRANSFER PRICING AND ACTIVITY-BASED COSTING (ABC)

Teva Pharmaceutical Industries Ltd. of Israel rejected the negotiated transfer price approach because senior executives believed that this approach would lead to endless, nonproductive arguments. Instead, the company uses activity-based costing to set its transfer prices. The firm charges marketing divisions for unit-level costs based on the actual quantities of each product they acquire. In addition, they are charged batch-level costs based on the actual number of batches their orders require. Finally, the marketing division is charged a lump-sum amount for product- and facility-level costs.

COMMENTARY: Essentially, **Teva** sets its transfer prices based on carefully computed costs. This system sends the marketing managers the correct signals about how much it really costs the company to produce each product. With this information, the marketing managers are better equipped to make pricing and other decisions regarding the products.

Source: Robert S. Kaplan, Dan Weiss, and Eyal Desheh, "Transfer Pricing with ABC," *Management Accounting*, May 1997, pp. 20–28.

that the actions of divisional managers will always be in the best interests of the company as a whole. Such suboptimization is one of the unavoidable costs of decentralization.

Market-based transfer prices are in theory the most sound because the market price provides the best measure of the opportunity cost of interdivisional transfer. Setting the transfer price at the competitive market price always results in both divisions voluntarily making the right decisions from the perspective of the company as a whole. In some settings, it is difficult to identify a market price because there is no ready market for the transferred goods or services. In these cases, we cannot use market-based transfer prices. Firms commonly encounter such settings, particularly when they transfer goods or services not readily available in the marketplace.

Allowing the divisions to negotiate the transfer price is appealing. It gives them considerable autonomy, which is the essence of decentralization. As long as divisional managers behave rationally and negotiate a transfer anywhere in the acceptable range of transfer prices, effective decisions will result. However, negotiations could often be time-consuming and difficult because of the conflicting interests of the divisional managers. Even well-intentioned managers may find themselves in lengthy negotiations, with personality issues clouding the discussion.

Surveys show that firms prefer to use market-based transfer prices whenever available. Such prices account for 30 to 50% of all transfer prices. Cost-based transfer prices account for 25 to 50% of transfers, with full-cost-based pricing being the most popular. Negotiated transfer prices account for the balance. In the Appendix, we illustrate how to compute economically optimal transfer prices.

INTERNATIONAL TRANSFER PRICING

Globalization brings another significant dimension to the transfer-pricing problem. Multi-national corporations (MNCs) sell goods and services in multiple markets. They locate their divisions and subsidiaries all over the world to compete effectively in these markets. Additional considerations arise in setting transfer prices for MNCs, including:

1. Transfer pricing allows MNCs to *shift* income across borders. It is in the MNC's best interest to set a transfer price that minimizes the total taxes paid by taking into account differences in income tax rules across nations, and custom duties and tariffs imposed on imports by countries. For example, MNCs can benefit by transferring income from high-tax countries to low-tax countries.
2. An MNC entering a new foreign market may want to enable its subsidiary in that country to compete effectively by charging a low transfer price. This low price in turn allows the subsidiary to charge lower prices for its products.
3. Many countries impose restrictions on foreign currency exchange. Moreover, there are inherent risks involved in foreign exchange transactions. MNCs manage these considerations by carefully adjusting transfer prices on interdivisional transfers across borders.

These considerations can outweigh the internal performance evaluation considerations for MNCs when it comes to setting transfer prices.

Of course, tax authorities in almost every country have legislation governing transfer-pricing practices. These laws are designed to prevent opportunistic transfer pricing by MNCs. While international transfer pricing provides many tax-planning opportunities, firms must take care to comply with all of the legal and ethical standards surrounding their operations.

SUMMARY

In this chapter, we examined the demand for decentralization. We discussed the costs and benefits associated with decentralized decision making, common forms of decentralization, and the need to implement performance evaluation systems and incentive schemes in decentralized environments. We focused particularly on the principles of performance measurement and on how to tailor performance measures to the specific form of decentralization. Finally, we discussed how to set up transfer prices that motivate divisions to work together to generate economic surplus, even if they compete against each other to share the surplus.

Throughout this chapter, we emphasized the short-term nature of many performance measures such as variance analysis and ROI. These measures focus on current-period performance, meaning that they provide little information about future-period performance. In the next chapter, we discuss how organizations expand the scope of their analysis beyond organizational boundaries. We also look at how they use lead measures of future financial performance, such as the balanced scorecard.

RAPID REVIEW

LEARNING OBJECTIVE 1

Explain the costs and benefits of decentralization.

- Decentralization is the delegation of the authority to make decisions throughout the organization. The benefits of decentralization are (1) bringing the best information to make timely decisions; (2) tailoring managerial skills and specializations to job requirements; (3) empowerment and job satisfaction; and (4) training of future managers. The costs of decentralization include (1) emphasizing local goals at the expense of global goals; (2) the need for costly coordination; and (3) the need for performance evaluation and incentive systems.
- Common forms of decentralization include cost, profit, and investment centers, with the labels reflecting the decision rights assigned to the managers of these units.

LEARNING OBJECTIVE 2

Apply the principles of performance measurement.

- Controllability is the idea that we hold managers accountable only for items in their control. Informativeness is the notion that any metric that provides information about a manager's effort and/or skill could be a useful performance measure. Informativeness leads to practices such as relative performance evaluation, which uses an uncontrollable benchmark to filter out common "noise" in the performance measure.
- Ideally, the best performance measures (1) reflect the decision rights assigned to the individual/organizational unit; (2) align employee and organizational goals;

- (3) yield the maximum information about the decisions or actions of the individual/organizational subunit; (4) have low measurement error; and (5) are easy to understand and communicate. Firms generally use a portfolio of measures because no one measure possesses all these desired properties.

LEARNING OBJECTIVE 3

Rate the performance of cost and profit centers.

- Firms usually employ budget variances to measure cost center performance in the short term. To ensure that longer-term goals are being pursued, firms frequently use benchmarking and kaizen.
- Firms use divisional profit before taxes to measure the performance of profit centers. Divisional profit before taxes equals revenue less variable costs less traceable fixed costs.

LEARNING OBJECTIVE 4

Evaluate the performance of investment centers.

- There are three popular measures—ROI, RI, and EVA—for measuring investment center performance.
- Return on investment (ROI) equals a division's operating income divided by its investment. ROI is the most popular measure of investment center performance. It allows for a ready comparison of investment centers of different size. The major criticism of ROI is that it leads to underinvestment because managers have an incentive to reject profitable projects that exceed the firm's cost of capital but are lower than current ROI.

- Residual income (RI) equals the income that a division generates beyond the required rate of return. Unlike ROI, RI does not lead to underinvestment. However, RI does suffer from two limitations: it does not control for the size of the investment, and rankings using RI depend crucially on the chosen required rate of return.
- Economic value added (EVA) is similar in concept to RI and, as such, shares some of the same advantages and disadvantages. EVA specifies how to adjust accounting income to better capture “economic income” and how to compute the weighted average cost of capital.
- Transfer prices do not affect corporate pre-tax profit. The demand for transfer pricing arises from decisions that employ divisional income. Such decisions include resource allocation and performance evaluation. Firms could also use transfer prices for tax planning when divisions are located in different tax jurisdictions.
- The conflict between the demand for decentralization that treats the divisions as stand-alone entities, and the desire to exploit synergies that treats divisions as part of a whole, is the central issue in setting effective transfer prices.

LEARNING OBJECTIVE 5

Describe transfer pricing.

- Firms employ transfer prices that might be cost-based, market-based, or negotiated. Each method has advantages and disadvantages, although market-based prices are generally preferred when available.
- Corporations could use transfer prices strategically to reduce their tax burden. Although we expect firms to act in an ethical and equitable manner, tax authorities have a number of rules and regulations that govern international transfer pricing.
- Transfer prices account for the economic value of intrafirm transfers of goods and services. Nevertheless, firms still recognize the economic effects of the transaction by using a transfer price to record a “sale” by the selling division and a “purchase” by the buying division.

Appendix

ECONOMICALLY OPTIMAL TRANSFER PRICES

In this appendix, we dig deeper into the costs and benefits of alternate transfer pricing rules by examining the transfer-pricing issue from each division's perspective. Doing so allows us to determine the range of transfer prices that would be acceptable to both divisions *and* would lead them to act in a way that benefits the firm as a whole. Such behavior is economically optimal.

Consider the selling division—it wants to get the maximum amount for its goods and services. Its profit from internal transfer is the transfer price less the cost of the transfer. Moreover, the division would prefer to transfer only if the profit from the transfer exceeds its opportunity cost, which is the profit from alternate uses for its resources. Thus, the *minimum* price that the selling division wants from the transfer is the cost of the transfer plus the opportunity cost of the transfer. Otherwise, the selling division is better off by rejecting the offer and using its resources more profitably. Accordingly, the minimum transfer price the selling division will voluntarily agree to is

$$TP_{MIN} = \text{Variable cost of transfer} + \text{Selling division's opportunity cost of transfer}$$

The buying division wants to pay the least amount for the goods and services received. If the selling division is not competitive with outside suppliers, then the buying division is better off buying elsewhere. Thus, the maximum amount the buying division is willing to pay is its opportunity cost:

$$TP_{MAX} = \text{Buying division's opportunity cost of transfer}$$

As long as the maximum price the buying division is willing to pay, TP_{MAX} , is higher than the minimum price the selling division is willing to accept, TP_{MIN} , both divisions will agree to the internal transfer at any price, say TP , between TP_{MAX} and TP_{MIN} . More importantly, such a transfer will benefit the firm as a whole. Why? The reason is that internal supply (by the selling division) is cheaper for the firm than having the buying division procure from outside.

On the other hand, if the maximum price the buying division is willing to pay, TP_{MAX} , is less than the minimum price the selling division is willing to accept, TP_{MIN} , both divisions will never agree to the internal transfer. In fact, the firm as a whole is better off if the transfer does not take place. With the transfer, the firm is giving up more in the selling division than it gains in the buying division. Thus, finding the economically optimal transfer price is an exercise in determining opportunity costs for both divisions. Let us consider an example to illustrate these points.

Transfer-Pricing Example

Consider an electronics firm that has two divisions: chip and phone. As Exhibit 12.12 shows, the chip division produces two kinds of integrated circuit chips: GPS and Mobile Phone. The GPS chip, sold on the open market, has a demand of 40,000 units at its current price of \$30 per chip. The chip division currently sells 60,000 units of the mobile phone chip to the phone division. The chip division can make 100,000 GPS chips, or 100,000 mobile phone chips, or any combination thereof.

Exhibit 12.13 provides pertinent information for the two divisions. Note that the chip division's fixed costs are not relevant with respect to the decision concerning the transfer price.

We analyze three different scenarios. The scenarios, summarized in Exhibit 12.14, differ in terms of the market demand for GPS chips and the potential for savings costs from internal transfers.

SCENARIO 1

Suppose there is a competitive market for the mobile phone chips and the market price is \$30 per chip. Then, there is no gain from internal transfer because the divisions can get the same value elsewhere. If it does not make a transfer, the chip

Exhibit 12.12 *Flow of Goods and Services*

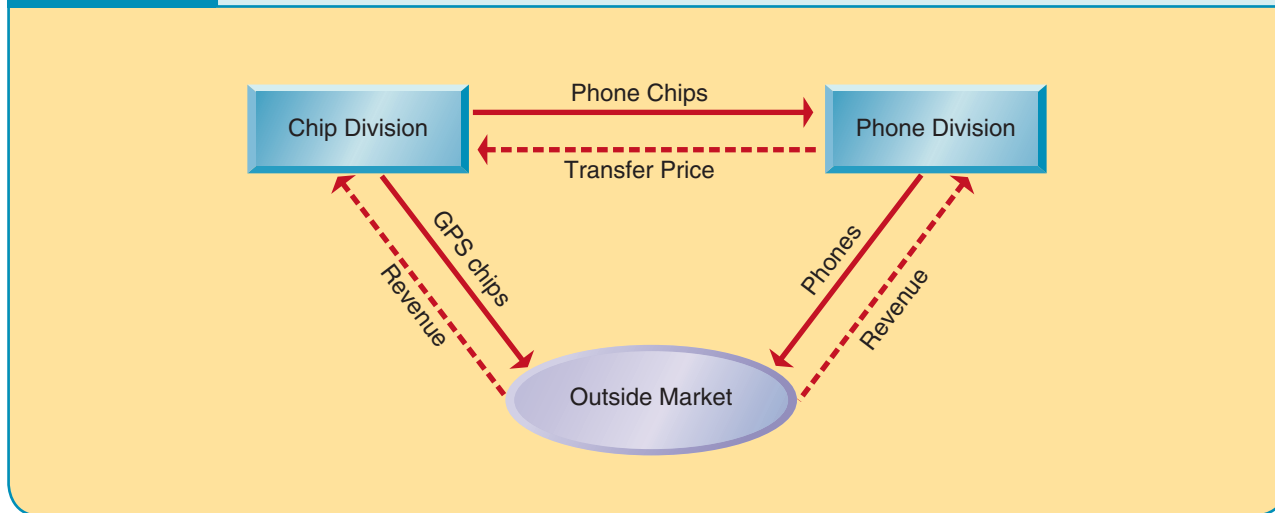


Exhibit 12.13 *Transfer Pricing Example*

	Chip Division		Phone Division
	Mobile Phone Chip	GPS Chip	
Price	?	\$40 per chip	\$100 per phone
Variable cost	\$12 per chip	\$15 per chip	\$22 per phone*
Demand	60,000 chips	40,000 chips	60,000 phones
Capacity	100,000 chips in total		60,000 phones
Fixed costs	\$750,000 in total		\$540,000

* Does not include the cost of the chip; each phone uses one chip.

Exhibit 12.14 Scenarios Analyzed			
	Scenario 1	Scenario 2	Scenario 3
Market demand			
GPS chip	40,000	40,000	100,000
Phone chip	60,000	60,000	60,000
Total demand	100,000	100,000	160,000
Available capacity	100,000	100,000	100,000
Surplus/Shortfall	0	0	(60,000)
Cost savings from internal transfer of phone chip			
Chip division	None	\$1 per chip	\$1 per chip
Phone division	None	\$2 per chip	\$2 per chip

division can sell its phone chips in the open market and make a contribution margin of \$18 per chip (= \$30 – \$12). The chip division would lose this external sale if it transfers internally, meaning that its opportunity cost for a transfer is \$18 per chip. The selling division’s minimum price is therefore \$30 per chip (variable cost per chip \$12 + opportunity cost per chip \$18).

Similarly, the buying division would not pay more than \$30 per phone chip. Its opportunity cost is \$30 per chip because it can procure the item for this amount from the open market.

The transfer-pricing problem is trivial because $TP_{MAX} = TP_{MIN} = \$30$. Moreover, the firm’s overall profit is the same whether the divisions deal with each other or decide to buy or sell in the market.

SCENARIO 2

Now, suppose that the chip division can save \$1 per phone chip by selling internally because it avoids some of the distribution costs associated with selling in the open market. That is, its variable cost per chip would be \$11 instead of \$12. Likewise, because the phone division is better able to coordinate deliveries, it saves \$2 per phone in variable costs by buying internally. That is, its variable cost per phone would be \$20 instead of \$22 per phone.

As before, for every chip transferred internally, the chip division loses a contribution margin of \$18 per chip from not selling it outside (price of \$30 – variable cost of \$12). Because the chip division’s variable cost for an internal transfer is \$11 now, the chip division’s minimum acceptable price (TP_{MIN}) is \$29, the sum of the \$11 variable cost and the \$18 contribution margin.

For the phone division, buying *externally* costs \$30 per chip, plus \$22 of additional variable costs, for a total of \$52. Because the phone division incurs only \$20 of variable cost with an *internal* chip, it can pay up to \$32 for the *internal* transfer. Beyond



Check It! Exercise #4

Suppose the chip division’s variable costs increase by \$0.50 to \$12.50 per phone chip if it transfers the chips internally. Assume the phone division’s variable costs still decrease by \$2 to \$20 relative to buying externally. Verify that the range of acceptable transfer prices is \$30.50 to \$32.00.

this price, its total cost from internal transfer would be higher than \$52. Buying the chip from outside then becomes attractive. At this price of $TP_{MAX} = \$32$, the phone division is indifferent between buying internally or externally.

Thus, any price between \$29 and \$32 per phone chip is acceptable to both divisions. This arrangement benefits the firm as well. For each chip transferred internally, the firm saves a total \$3 in variable selling and delivery costs.

SCENARIO 3

Suppose the demand for the GPS chip is 100,000 units rather than 40,000 units, at a unit price of \$40 per GPS chip. As in Scenario 2, there is a \$3 total savings in variable costs per chip if an internal transfer occurs.

With a demand of 100,000 units for the GPS chip at a price of \$40 per chip, it makes sense for the chip division to use all of its capacity to make and sell the GPS chip exclusively. At this price, the contribution margin for the GPS chip is \$25. This amount is higher than the contribution margin of \$18 for the mobile phone chip. If the chip division uses up capacity to transfer a phone chip, it loses the opportunity to earn a contribution margin of \$25 by making and selling a GPS chip. When we combine variable costs of \$11 per chip to make the phone chip with the \$25 contribution margin, we see that the chip division's minimum acceptable transfer price (TP_{MIN}) is \$36 per chip.

Although the chip division's situation has changed, the phone division's situation has not. The maximum transfer price it is willing to pay (i.e., TP_{MAX}) remains at \$32. Thus, the two divisions cannot agree on a price, and the transfer will not take place. The chip division will not sell for less than \$36 per chip; the phone division will not purchase for more than \$32 per chip. It is easy to verify that the firm loses as a whole if it forces a transfer at a price of \$34 per phone chip. Thus, even though transferring the chip internally generates some cost savings, the firm gains more when it uses the capacity to make GPS chips.

Exhibit 12.15 summarizes the analyses for the three scenarios.

Exhibit 12.15 <i>Opportunity Cost Analysis</i>		Scenario 1	Scenario 2	Scenario 3
Chip Division				
Variable cost of phone chip		\$12	\$12	\$12
Lost contribution from external sales		18	18	\$25*
Cost savings realized from transfer		0	(\$1)	(\$1)
Minimum acceptable price		\$30	\$29	\$36
Phone Division				
Market price for external purchase		\$30	\$30	\$30
Cost savings realized from transfer		0	2	2
Maximum acceptable price for transfer		\$30	\$32	\$32
Profit effect for overall firm				
Will divisions agree on transfer price?		Yes	Yes	No
Is transfer profitable for overall firm?		No effect	Yes	No

* The chip division loses the chance to sell one GPS chip for each phone chip transferred internally.

ANSWERS TO CHECK IT! EXERCISES

Exercise 1: Average book value of assets = $(\$7,150,000 + \$6,850,000)/2 = \$7,000,000$; Other operating investments, average = $(\$1,100,000 + \$1,300,000)/2 = \$1,200,000$; Average investment = $\$7,000,000 + \$1,200,000 = \$8,200,000$. Depreciation for the year = $\$7,150,000 + \$250,000 - \$6,850,000 = \$550,000$.

Exercise 2: Asset turnover = $\$6,400,000/\$8,000,000 = 0.80$; Profit margin = $\$800,000/\$6,400,000 = .125$ or 12.5%; ROI = profit margin \times asset turnover = $0.80 \times .125 = 10\%$.

Exercise 3: In Scenario 1, EVA = $\$1,405,600 - [0.18 \times (\$10,450,000 - \$245,000)] = (\$431,300)$. In Scenario 2, EVA = $\$756,000 - [0.18 \times (\$3,500,000 - \$650,000)] = \$243,000$.

Exercise 4 (appendix): For the chip division, the contribution margin from an external sale = \$18.00 per chip and the controllable cost = \$12.50 per chip. Thus, $TP_{\text{MIN}} = \$12.50 + \$18.00 = \$30.50$ per chip. For the phone division, TP_{MAX} is still \$32 = \$52 total variable cost of buying externally – \$20 variable phone cost of buying internally. Thus, the range of acceptable transfer prices is \$30.50 to \$32.00. If the transfer price is set anywhere in this range, the company as a whole saves \$1.50 for every chip that is internally transferred.

SELF-STUDY PROBLEMS

General Robots is an international conglomerate, operating multiple businesses in multiple countries. The data in Exhibit 12.16 pertain to three of General Robots' divisions for the most recent year of operations.

- a. Calculate each division's return on investment, using both gross book value and net book value to measure investment. In addition, compute each division's residual income and EVA. For both RI and EVA, use the required rate of return to compute the capital charge, and the net book value of assets to measure investment.

We know that:

$$\text{Return on investment} = \text{Divisional income} / \text{Divisional investment}$$

$$\text{Residual income} = \text{Divisional income} - (\text{Required rate of return} \times \text{Divisional investment})$$

$$\text{Economic value added} = \text{Net operating income after taxes} - [\text{WACC} \times (\text{Investment} - \text{Current liabilities})]$$

Using these formulas and the information provided, we have Exhibit 12.17.

Exhibit 12.16 Select Divisional Data for General Robots

	Division A	Division B	Division C
Division income before taxes	\$1,150,000	\$2,241,000	\$1,520,000
Gross book value of assets	\$11,500,000	\$12,450,000	\$7,600,000
Accumulated depreciation	\$4,312,500	\$1,245,000	\$1,520,000
Net book value of assets	\$7,187,500	\$11,205,000	\$6,080,000
Current liabilities	\$245,000	\$325,000	\$150,000
Tax rate in relevant country	30%	30%	25%
Required rate of return	14%	12%	16%

Exhibit 12.17 Performance Data for Select Divisions of General Robots

	Division A	Division B	Division C
<i>Return on investment</i>			
Gross book value ¹	10.00%	18.00%	20.00%
Net book value ²	16.00%	20.00%	25.00%
Residual income ³	\$143,750	\$896,400	\$547,200
EVA ⁴	(\$166,950)	\$263,100	\$191,200

¹ Division A: $\$1,150,000/\$11,500,000 = 10\%$; Division B: $\$2,241,000/\$12,450,000 = 18\%$ Division C: $\$1,520,000/\$7,600,000 = 20\%$

² Division A: $\$1,150,000/\$7,187,500 = 16\%$; Division B: $\$2,241,000/\$11,205,000 = 20\%$ Division C: $\$1,520,000/\$6,080,000 = 25\%$

³ Division A: $\$1,150,000 - 0.14 \times \$7,187,500 = \$143,750$; Division B: $\$2,241,000 - 0.12 \times \$11,205,000 = \$896,400$; Division C: $\$1,520,000 - 0.16 \times \$6,080,000 = \$547,200$

⁴ Division A: $\$1,150,000 \times (1 - 0.30) - 0.14 \times (\$7,187,500 - \$245,000) = (\$166,950)$; Division B: $\$2,241,000 \times (1 - 0.30) - 0.12 \times (\$11,205,000 - \$325,000) = \$263,100$; Division C: $\$1,520,000 \times (1 - 0.25) - 0.16 \times (\$6,080,000 - \$150,000) = \$191,200$

b. Comment on the results, paying particular attention to variations in the performance measures across divisions.

We find that Division C has the highest ROI when we measure investment using either gross or net book value. The disparity across divisions narrows somewhat with net book value. Division A appears to have the oldest assets as its ROI increases the most when we use net book value, rather than gross book value, to measure investment.

All three divisions generate positive residual income, with Division B leading the way. The differing required rates of return probably relate to risk—compared to Division C, Division B probably is in a stable, relatively risk-free business. Moreover, Division B's RI exceeds that of Division C both because it has a lower required rate of return and because Division B is larger in size.

The EVA for Division A is negative. This is because the divisions' after-tax rate of return of $[16\% \times (1 - 0.3)] = 11.12\%$ is lower than the required return on 16%. Adjusting for non-interest bearing current liabilities boosts EVA but not enough to overcome the lower return. Division B continues to outperform Division C in terms of EVA, even though Division B is disadvantaged in its tax environment.

This problem illustrates that the rank ordering of divisions depends on the metrics that we use to evaluate performance and, though not illustrated in the problem, the specific measures that we use for each metric (e.g., our rank ordering of ROI could change depending on whether we use gross or net book value). This example underscores the importance of selecting the right performance measures and benchmarks.

GLOSSARY

Benchmarking Systematic evaluation of various activities and business processes relative to the best practices.

Controllable performance measure A performance measure that reflects only the consequences of the actions taken by the decision maker.

Decentralization The practice of delegating authority to lower-level managers.

Discretionary cost center A cost center for which there is no clear relation between inputs and outputs.

DuPont model A method for decomposing ROI into two component parts: profit margin and asset turnover.

Economic value added (EVA) A performance measure similar to residual income. The difference is that EVA has specific guidelines on how to compute income, investment, and the weighted average cost of capital.

Engineered cost centers Cost centers for which there is a clear relation between inputs and outputs.

Informativeness principle The notion that any metric that provides information about a manager's effort or skill could be a useful performance measure.

Kaizen Philosophy of continuous improvement.

Relative performance evaluation The practice of measuring a manager's or a division's performance against other managers or divisions.

Residual income (RI) The income that a division generates over and above the required rate of return on investment.

Responsibility center An organizational subunit with specified decision rights. There are three common forms of

responsibility centers: cost centers, profit centers, and investment centers.

Return on investment (ROI) A measure of profit generated per dollar of investment—equals divisional operating income divided by divisional investment.

Transfer price A notional price paid for an internal transfer of goods or services.

REVIEW QUESTIONS

12.1 LO1. Why do firms decentralize?

12.2 LO1. List two benefits and two costs associated with decentralization.

12.3 LO2. What are the three common forms of responsibility centers we find in organizations?

12.4 LO2. What are the responsibilities of a cost center manager?

12.5 LO2. What are the responsibilities of a profit center manager?

12.6 LO2. What are the responsibilities of an investment center manager?

12.7 LO2. What are the two key principles of performance measurement?

12.8 LO2. List three characteristics of an effective performance measure.

12.9 LO3. How are cost center managers commonly evaluated?

12.10 LO3. What does the term *kaizen* mean?

12.11 LO3. How are profit center managers commonly evaluated?

12.12 LO4. Define ROI. List two advantages and two disadvantages of using ROI as a measure to evaluate investment centers.

12.13 LO4. Define residual income. What is the difference between economic value added (EVA) and residual income?

12.14 LO5. Why is transfer pricing necessary in organizations with multiple divisions?

12.15 LO5. What are the three common approaches to transfer pricing? List one advantage and one disadvantage associated with each of these three approaches.

DISCUSSION QUESTIONS

12.16 LO1. Organizational experts say that decentralization “co-locates knowledge and decision rights.” What does this statement mean? Is decentralization always beneficial? What are the costs associated with delegating decision making to lower levels of an organization?

12.17 LO1. Consider the various tasks that need to be accomplished within a household (e.g., take out garbage, cook, clean, mow lawn). Can you think of how a family might decentralize the execution of these tasks? Do we need motivating, monitoring, and evaluation measures as well?

12.18 LO1. Some argue that decentralization results in maximizing profit division by division. It may not lead to profit maximization at the overall firm level. Do you agree? Why or why not?

12.19 LO1. Both the U.S. Army and the University of Wisconsin are large complex entities with numerous employees. Comment on the differences to which these organizations are decentralized, as well

as variations in the monitoring and performance evaluation systems.

12.20 LO2. In choosing a performance measure, many argue that *controllability* is the operative principle in that a manager should be able to influence the metric. Some argue for *informativeness*, which says that any metric that provides insight into the manager's performance (whether controllable or not) is a good measure. Discuss, providing an example of an informative measure that is not controllable.

12.21 LO2. “Why not simply evaluate the performance of all divisional managers based on the entire firm's profit? That way, we do not have to worry about divisional managers not acting in the firm's best interests.” Is this a reasonable argument? Why or why not?

12.22 LO3. Discuss the role for variance analysis (see Chapter 8) in evaluating cost center/profit center managers.

- 12.23 LO4.** When evaluating investment centers, what are some of the disadvantages of using net book value to measure investment?
- 12.24 LO4.** Two divisions with exactly the same return on investment (ROI) can have different residual incomes (RI). Why?
- 12.25 LO4.** Some argue that both ROI and RI motivate managers to focus on short-term performance, since both the measures are calculated using operating performance (i.e., operating income). Yet, ROI is widely used as a performance measure. Provide a brief discussion.
- 12.26 LO5.** Explain why capacity utilization in a supplying division is such an important consideration when choosing a transfer pricing policy.
- 12.27 LO5.** A firm often obtains services from subsidiaries in which the firm's key officers may hold minority ownership. What incentive conflicts do such arrangements pose?
- 12.28 LO5.** Discuss some problems that arise when pricing the transfer of intellectual property.
- 12.29 LO5 (Advanced).** In many situations, it is difficult to determine the market price for a supplying division (because there is no ready market for the intermediate product). Discuss the options available for transfer pricing in such settings.
- 12.30 LO5 (Advanced).** Is it advisable for the head office to interfere in transfer-pricing disputes among its divisions? Why or why not?

EXERCISES

12.31 Responsibility accounting (LO1, LO2). Karl Krader oversees a staff of over 200 persons and a budget of close to a million dollars per year. He is responsible for the upkeep of all buildings and equipment at a large university. However, any reconstruction project is budgeted and administered separately. Karl's responsibilities include selection and evaluation of personnel, negotiating with suppliers, choosing the kinds of landscaping, and so on. Karl's services, however, are not priced out to the user departments or to individual units within the university.

Required:

- Should Karl be evaluated as a profit center or a cost center?
- How should the university evaluate Karl's performance?

12.32 Responsibility accounting (LO1, LO2). Jose's Cantina is a chain of 20 fast-food restaurants. Gordon Martinez started the firm 10 years ago to provide affordable, fast, good quality Mexican cuisine. He locates branches near college campuses and areas with large populations of young adults. To oversee daily operations, he has hired managers for each branch and city. However, Gordon keeps a tight rein on operations. He personally approves all capital expenditures, menu changes, and so on. Branches get deliveries each day and offer a fixed menu of items at firm prices.

Required:

- Classify the branches as being profit or cost centers. Justify.
- Based on your answer to (a) above, briefly describe how you will evaluate the performance of each branch.

12.33 Responsibility accounting (LO1). Cynthia O'Brien has identified the following five major functional areas:

- Marketing:* Identify and develop customers, bring in the revenues, keep track of competitive landscape, and forecast demand conditions so that the division can budget and plan effectively.
- Production:* Meet production targets by making the most efficient use of factory resources available.
- Planning and coordination:* Coordinate all divisional functions so that everybody is on the same page. It is responsible for budgeting and ensuring implementation of budgets.
- Maintenance:* Ensure proper functioning of plant and equipment and provide technical support to the production function.
- Purchasing:* Oversee procurement of various input materials and inventory management. This department also develops new vendors and evaluates outsourcing options.

Required:

Classify each of the five functions as a cost center or profit center. If classified as a cost center, discuss whether it is a discretionary cost center. Briefly describe how you will evaluate the performance of each function.

- 12.34 Discretionary cost centers (LO1).** James Lowell heads the Strategic Planning Group for a major conglomerate. He and his staff of five are charged with helping top management formulate and implement strategy. They act as internal consultants when identifying target acquisitions or evaluating new product lines, regional expansions, and such.

Required:

What kind of a responsibility center is the Strategic Planning Group? How could we evaluate its performance?

- 12.35 Performance evaluation, profit center (LO3).** Lori White is the chief executive of a division of Visions, Inc. Lori's division makes high-quality frames that sell for premium prices. For the most recent budget year, her division expected to sell 80,000 frames and receive \$9.6 million. Actual sales and revenues were 100,000 frames and \$11 million, respectively. Lori delegates all marketing and sales related decisions (including pricing) to her marketing manager.

Required:

- Should Lori be pleased with the revenue performance?
 - Suppose instead that the actual sales were 70,000 frames for revenues of \$9,100,000. Should Lori be upset with the revenue performance? List some of the issues that Lori should look into when analyzing this performance.
- 12.36 Cost center (LO3).** The Production Department of Advent Cordless Phones is a cost center. The following table provides budgeted and actual cost information for the most recent year.

	<i>Budget</i>	<i>Actual</i>
Production volume (units)	175,000	200,000
Total variable costs	\$7,875,000	\$9,450,000
Total fixed costs	1,200,000	\$1,350,000

Required:

Evaluate the performance of the Production Department.

- 12.37 Cost center (LO2).** The following table provides budgeted and actual cost information for Advent Cordless Phones:

	<i>Budget</i>	<i>Actual</i>
Production volume (units)	200,000	150,000
Total variable costs	\$9,200,000	\$6,875,000
Total fixed costs	1,300,000	\$1,350,000

Required:

- Evaluate the performance of the Production Department during the budget year.
 - An investigation reveals a breakdown of a crucial piece of equipment during the year that restricted output considerably. It was determined that \$75,000 of the fixed costs and \$120,000 of the variable costs were attributable to this problem. How will your answer to part (a) change in light of this new information?
- 12.38 Profit center, qualitative (LO3).** "In my current position, I have met my profit target for 8 quarters in a row. I am 110% confident that I can meet similar stretch goals for you, if given the opportunity." This was Greg Sierra's boast when he interviewed to be a profit center head at a large corporation. Greg had a history of turning in very good results for two to three years, and then switching jobs. As evidence of his exemplary (modestly stated, of course) managerial talent, Greg always likes to point out that his units' performance unfailingly went down after he quit.

Required:

- What might be an alternate reason for the lower performance after Greg leaves a profit center he supervises?
- What kinds of performance measures could you add to profit goals to ensure that Greg also pays appropriate attention to long-term goals?

12.39 Investment center performance (LO4). Refer to the data in the following table:



	<i>Operating Income</i>	<i>Investment</i>	<i>ROI</i>	<i>Required Rate of Return</i>	<i>RI</i>
1	\$225,000	\$1,800,000	?	14%	?
2	?	\$2,500,000	10%	8%	?
3	\$500,000	?	10%	?	\$125,000
4	\$150,000	\$1,200,000	?	?	(\$18,000)

Required:

Treating each row of the table independently, compute the missing information.

12.40 Residual income and changing rates (LO4). The following data pertain to two divisions, A and B, of a large corporation:

	<i>Division A</i>	<i>Division B</i>
Profit	\$3,750,000	\$1,100,000
Investment	\$31,250,000	\$5,500,000

Required:

- Determine the higher ranked division using residual income (with cost of capital or the required rate of return at 10%) as the criterion.
- Repeat part (a), but using 14% as the cost of capital.
- How do you explain the conflicting results in parts (a) and (b)?

12.41 ROI, Residual income and division size (LO4). The following data pertain to two divisions, Western and Eastern, of a large corporation. This corporation was established on the East Coast of the United States. It has recently expanded to the West Coast to take advantage of the greater profit potential in the growing western states.

	<i>Eastern</i>	<i>Western</i>
Profit	\$ 3,000,000	\$ 780,000
Investment	\$24,000,000	\$3,900,000

Required:

- Determine the higher ranked division using residual income (with cost of capital at 10%) as the criterion.
- Repeat the exercise in part (a), but using ROI as the criterion.
- How do you explain the conflicting results in parts (a) and (b)?

12.42 Transfer pricing (LO5). Able Electronics makes some of its products in Thailand and sells them in the United States. Able informs you that this year, it plans to transfer 250,000 units of a product (Variable cost = \$10 per unit and associated fixed costs are \$1,500,000 per year) from Thailand to the United States. The product sells for \$25 per unit in the United States.

Required:

- Suppose the transfer price were set at full cost. Considering this product alone, compute the profit reported in Thailand, in the United States, and for Able as a whole.
- Suppose the transfer occurs at a price of \$20 per unit. Considering this product alone, compute the profit reported in Thailand, the United States, and for Able as a whole.
- What inferences do you draw about the role of transfer prices in determining the pretax profit for the corporation as whole? Will your conclusion generally hold if we consider after-tax profit?

12.43 Transfer pricing (LO5). Rajdeep Scooters is organized as multiple divisions. All divisions are profit centers. The Engine Division manufactures two-stroke engines used by the assembly division. The market price of the engine is Rs. 18,000. (Rs. stands for rupees, the currency in India.) The division's cost sheet contains the following information about an engine's cost:

<i>Item</i>	<i>Cost</i>
Direct materials	Rs. 6,000
Direct labor	3,000
Variable overhead	1,000
Fixed overhead	2,000

Required:

- What would be the transfer price if the company uses a policy of setting the transfer price at variable cost plus a 20% markup?
- What would be the transfer price if the company uses a policy of setting the transfer price at full cost plus 10% markup?
- Comment on whether either of the above two estimates would be a “fair” transfer price.

12.44 Transfer pricing and capacity utilization (LO5). Division A manufactures screens used in high-definition TVs. It sells its one product, a standard screen, for a price of \$210 per screen. Variable costs are \$90 per screen, and allocated fixed costs amount to \$95 per screen. Division B has asked Division A to supply 5,000 custom-made screens. These custom screens have a variable cost of \$105 per unit. Division A believes that its standard screen and the custom screen for Division B consume the same amount of capacity to make. It now has the capacity to make 20,000 screens annually.

Required:

For each of the following scenarios, what is the minimum price *per custom screen* that Division A can set for this transfer and maintain its profit at the current level?

- Division A is currently making 12,000 standard screens.
- Division A is operating at capacity.
- Division A is making and selling 16,000 standard screens currently. Division B wants to buy all 5,000 screens from Division A or none at all.

PROBLEMS

12.45 Responsibility accounting (LO1, LO2, LO3). Chemco International is a large firm that has operations in numerous countries and many product lines. However, the underlying manufacturing processes in the various factories have many factors in common. Accordingly, Chemco has assembled a team of 25 chemical engineers and process specialists. Any division could call on this team for help with improving their process. The team would then charge the division a predetermined amount. Chemco expects the central research facility to recover its costs but not make a profit.

Required:

- Should Chemco evaluate the central research group as a cost or profit center? What benefits and problems do you see with this choice?
- What would be a good way to evaluate the performance of the central research group?

12.46 Responsibility accounting, interdependent units (LO2, LO3). AlarmTek, Inc., makes and sells high-end home security systems. It has two divisions—a production division and a marketing division. The company treats the production division as a cost center and the marketing division as a revenue center. It evaluates the production division by comparing the actual cost performance to a flexible budget. Similarly, it evaluates the marketing division by comparing actual revenues less marketing and customer care costs to the corresponding budget. The following presents budgeted and actual performance for a recent year.

	<i>Budget</i>	<i>Actual</i>
Production volume (units)	40,000	45,000
Revenues	\$8,000,000	\$8,550,000
Variable production costs	\$4,000,000	\$4,050,000
Total fixed production costs	800,000	\$780,000
Variable marketing and customer care costs	400,000	640,000
Fixed marketing and customer care costs	250,000	450,000
Profit before taxes	\$2,550,000	2,630,000

Required:

- The production manager was very happy with his performance, but the marketing manager was fuming! Explain why by evaluating their performances.

- b. The marketing manager complained severely to the head office:

I helped sell more units, but the quality was bad! Look at my marketing costs! I did not spend any more in sales calls and promotions compared to last year. The only reason my costs are so high is because my department had to offer more after-sales service to handle a lot of customer complaints! I even lost out on revenues. I think my esteemed colleague on the production side is cutting corners to come under the cost budget. I think you have to change the way you evaluate performance.

Do you think the marketing manager might have a legitimate case? Explain.

- c. How would you improve the performance measurement and evaluation system to avoid such conflicts in the future?

12.47 Responsibility accounting, non-traditional setting (LO1, LO2, LO3). Dr. Dan Jagesia is a world-renowned surgeon who works for a university hospital. Dan receives a handsome salary from the university. In addition, he writes grant proposals and receives funds from federal and private agencies to support his research. Dan received grants totaling \$2.5 million last year alone, and his total funding averages \$4 million per year. In line with standard practice, the university adds, and the funding agencies pay, a 57% surcharge as overhead recovery. (This recovery is to cover administrative support, lab space, library, etc.) Dan also generates considerable revenue to the university via his clinical service (i.e., operating on patients). Dan often complains that he works for “free” as the patient revenue more than covers his salary.

Required:

How should the university evaluate Dan’s performance? Is he (and his lab) a profit center or a cost center?

12.48 Performance evaluation (ROI, RI, EVA) (LO4): Superior Leather Products, Inc., has two divisions: Travel Bags Division and Leather Accessories Division. The following table presents their performance for the most recent year.

	<i>Travel Bags</i>	<i>Leather Accessories</i>
Total assets	\$4,000,000	\$6,000,000
Current liabilities	175,000	800,000
Operating income (before taxes)	600,000	1,200,000

Required:

- Calculate the return on investment (ROI) for each division. Use operating income as the measure of income and use the total assets as the measure of investment.
- Calculate the residual income for each division. Assume the required rate of return on investment is 12%.
- Superior Leather has outstanding long-term debt with a market value of \$3 million and an interest rate of 8%. Its equity capital has a market value of \$7 million. The cost of equity is 12%. The income tax rate is 30%. Calculate the economic value added for each division. Recall that $WACC = (1 - \text{tax rate}) \times \% \text{ financed from debt} \times \text{cost of debt} + \% \text{ financed from equity} \times \text{cost of equity}$
- Which of the three measures would you recommend? Why?

12.49 ROI, RI and EVA (LO3, LO4). The following data pertain to Hercules Health Club’s operations for the most recent year.



	<i>Division A</i>	<i>Division B</i>
Revenues		\$12,500,000
Direct material costs	\$2,500,000	\$1,800,000*
Direct labor	\$2,000,000	\$1,500,000
Variable overhead	\$500,000	\$375,000
Fixed overhead	\$1,600,000	\$1,200,000
Total	\$6,600,000	\$4,875,000

* Does not include the cost of transfer from Division A.

Required:

- Calculate the ROI for Hercules. Use operating income and net book value of assets as the measures for income and investment respectively.
- Compute the residual income for Hercules, using 14% as the required rate of return.

- c. Compute the economic value added (EVA) for Hercules, making sure to separately show the calculation for weighted average cost of capital.
- d. What factors might explain the unusually high ROI for Hercules?
- e. Suppose Tom and Lynda identify a project that has a 20% ROI. Will they choose to invest in the project? Will your answer differ if, instead of being a family-owned business, Hercules was a branch in a network of gyms? What factors are central to your argument?

12.50 Incentives and actions, cost centers (LO2, LO3). Mansoor Ali is in charge of maintenance. He is evaluated based on a flexible budget based on the number of machine hours operated. Mansoor gets a sizable bonus if his actual costs come in below budget.

In recent months, complaints against the slow pace of maintenance work reached an all-time high. The sales manager complains that she lost a major sale because of production delays, caused by slow turnaround on machine repairs. The production manager says that he does his best to squeeze the most out of every machine because any time a machine requires maintenance it seems to take forever to get it back up into production. Mansoor's response is that it takes time to do a good job. He says that if he fixed the machine in two days rather than three, the machine would be back in the shop in two instead of six months. "If I do something, I do it right," says Mansoor.

Required:

- a. Discuss how, if at all, Mansoor's performance evaluation and compensation plans bear on the current situation.
- b. How could you modify the systems to induce a higher level of cooperation among the managers of the various functional units?

12.51 Upper unit performance (LO2). Consider the following two settings:

Setting 1: Firm A operates a set of branch offices. Branch offices usually can fulfill customers' needs themselves. However, occasionally, they lack a specialist in the area or may not have the needed programs. In such cases, they refer the customer to other branches (or get the specialist to visit for a day). The other branch is willing to spare the specialist because many customers transact with many branches (e.g., a corporation with many divisions interacting with the many branches of a bank).

Setting 2: Firm B operates a set of branch offices. These offices are self-contained, and there is little interaction across branches. Customers tend to be branch specific.

Required:

Comment on why firm A's incentive plan for branch managers might include both local and global (e.g., regional) measures of performance. Why is such a feature of less importance in firm B?



12.52 Performance evaluation & ROI (LO4, Advanced). MoviePlex, Inc., has giant movie theatre complexes in Houston, Atlanta, and Seattle. Each location is run independently, with the head office located in Atlanta. The three complexes are similar in size, with 12 screens each. The Seattle location is only a year old, the Atlanta location 3 years old, and the Houston location is 6 years old. The head office uses ROI to evaluate financial performance. The following table presents their performance for a recent year.

	Revenues	Variable Costs	Fixed Costs (incl. depreciation)	Invested Capital (net book value)	Annual Depreciation
Houston	\$8,500,000	\$2,800,000	\$2,400,000	\$18,000,000	\$1,200,000
Atlanta	8,300,000	2,600,000	2,200,000	21,000,000	1,300,000
Seattle	8,650,000	2,250,000	2,500,000	27,000,000	1,400,000

MoviePlex, Inc., uses 10% as the required rate of return. It also depreciates its assets based on straight-line depreciation (assume that the amount for depreciation has stayed the same for the past six years).

Required:

- a. Prepare a table with the three locations as rows. The four columns contain ROI and RI, each calculated using net book value and gross book value.
- b. Discuss the effect of the measure and the choice of how to value investments on the ranking of the three locations.

12.53 ROI, RI, Profit projection using high-low method (Chapter 4) (LO4). Reiman Industries, a merchandising firm, provides the following information regarding one of its divisions.

	Year 2007	Year 2008
Sales	\$2,400,000	\$2,700,000
Cost of goods sold	1,800,000	2,010,000
Gross margin	600,000	690,000
Selling expenses	480,000	510,000
Profit before tax	120,000	180,000
Average assets	\$2,100,000	\$2,225,000

The firm requires a 10% rate of return from its divisions.

Required:

Suppose sales for 2009 are expected to be \$3,000,000, and the average asset base was projected at \$2,275,000. Calculate the firm's return on investment and residual income for 2009.

12.54 Transfer pricing and taxes (LO5). Catlow Corporation makes testing equipment used in hospitals. Usually, this equipment is made to order. However, this year, a client backed out of the deal, forfeiting a \$50,000 penalty on an order worth \$750,000. The U.S. division therefore has an unsold machine on which it has spent \$625,000. It approached its European and Asian division heads as to whether they want the machine.



The European division says that it could pay up to \$700,000 for the machine as it expects to sell the machine for \$750,000. The Asian division is willing to pay \$675,000 only, even though it expects to sell the machine for \$775,000.

You know that the average tax rate is 45% in Europe, 20% in Asia, and 35% in the United States.

Required:

- From the perspective of Catlow Corporation, where should the machine be sold? What is the profit-maximizing transfer price? Assume that Catlow can justify any transfer price from \$625,000 to \$750,000 to all involved tax authorities.
- From the perspective of the U.S. division, which offer (from Europe or Asia) is more attractive? Why?
- What are the benefits and costs of the corporate office stepping in to enforce the transfer as determined in part (a) rather than the transfer desired by the U.S. division in part (b)?

12.55 Transfer pricing and ethics (LO5). The machinery building factory (MBF) of Packages, Ltd., makes machines used in packaging product. These machines are sold by Packages' regional office as a complete solution: that is, the regional office will sell not only the containers but also the equipment required to fill product. MBF transfers its machines to the regional packaging units at variable cost plus 50% toward recovery of overhead. Corporate management strongly believes that a full-cost-based price would create needless complications in terms of overhead allocations. Moreover, the 50% rate makes sure that the MBF keeps a tight lid on overhead costs.



Despite heroic efforts, the MBF's management cannot contain overhead to be 50% or less of variable costs. The actual ratio for the most recent year was 0.53, and management knows that another sub par year would jeopardize their jobs. The division manager of the MBF approaches you, the division controller, to explore possible actions. She believes that the current system for classifying costs into fixed and variable is broken. She offers some suggestions that would reclassify some costs from the "fixed" to the "variable" category. She argues that this classification is just a semantic issue as ALL costs are variable in the long term.

Required:

What should you do? Be sure to consider the IMA's ethical guidelines (see Appendix to Chapter 1) in your answer.

12.56 Transfer pricing, cost pools, and ethics (LO5, Advanced). The machinery-building factory (MBF) of Packages, Ltd., makes machines that are used in packaging products such as toothpaste. These machines are sold by Packages' regional office as a complete solution: that is, the regional office will not only sell the containers but also the equipment



required to fill the product. MBF transfers its machines to the regional packaging units at full cost (i.e., materials plus labor plus allocated overhead).

MBF recently branched out to sell foil printing machines in the open market. This expansion required it to purchase new computer-controlled lathes and milling machines. These machines require minimal labor input once they are set up. (The current manual lathes and milling machines could not provide the required quality. These machines have a man-machine ratio of 1, meaning that each machine hour requires one labor hour.)

During the past year, the market for foil printing machines has experienced some unanticipated shrinkage, imposing considerable price pressure on the existing suppliers (including MBF). The division is in danger of not meeting its profit goals for the third quarter in a row.

MBF's division manager comes to you, the division's controller, with a novel solution to her problem. She wishes you to modify the division's cost accounting system to a single pool system and use labor hours as the sole allocation basis.

Required:

- a. How does the manager's proposal help solve her problem? Notice that the proposal neither brings in additional revenue nor reduces costs. (Assume that the change itself would be costless to implement.)
- b. What should you do? Be sure to consider the IMA's ethical guidelines (see Appendix to Chapter 1) in your answer.



12.57 Transfer price and income measurement (LO5). The following table presents the performance of two divisions—Division A and Division B—of a company. Division A supplies an intermediate product to Division B. Although there is an outside market for Division A's product, it does not sell its product to the outside market.

	<i>Division A</i>	<i>Division B</i>
Revenues		\$12,500,000
Direct material costs	\$2,500,000	\$1,800,000*
Direct labor	\$2,000,000	\$1,500,000
Variable overhead	\$500,000	\$375,000
Fixed overhead	\$1,600,000	\$1,200,000
Total	\$6,600,000	\$4,875,000

* Does not include the cost of transfer from Division A.

Required:

- a. Assume that the transfer price is 110% of Division A's full cost. Prepare an income statement for each division.
- b. Assume that the transfer price is 120% of Division A's variable cost. Prepare an income statement for each division.
- c. Assume that the transfer price is the market price. If Division A could sell its entire output in the intermediate market, it would realize revenues of \$8,000,000. Prepare an income statement for each division.
- d. What conclusions do you draw from comparing your answers? Under what conditions would you recommend the transfer-pricing schemes in requirements in parts (a), (b), and (c) above?

12.58 Transfer pricing (LO5, Appendix). Quest Computers, Inc., makes microprocessor chips and personal computers. Its Microprocessor Division makes the chips and supplies them to the Personal Computer Division. The Personal Computer buys all the other necessary parts from outside vendors and assembles personal computers for home and business use. There is also a ready outside market for microprocessor chips made by the Microprocessor Division. The following cost and market data pertains to the two divisions:

Average estimated selling price for the personal computer	\$1,000
Market price for the microprocessor chip (per unit)	\$250
Variable costs in Personal Computer Division (excluding chip)	\$820
Variable costs for making the chip	\$100

The two divisions are profit centers. While Quest Computers, Inc., would not like its Microprocessor division to sell the advanced microprocessor chip to other computer manufacturers in the outside market, it nevertheless allows its divisional managers complete latitude in decision making.

The manager of the Microprocessor Division prefers to charge the Personal Computer Division the market price for transferring the chips. The manager of the Personal Computer Division makes the following calculations

Selling price—final product		\$1,000	
Transferred-in costs (market)	\$250		
Variable costs for completion	<u>820</u>	<u>1,070</u>	
Contribution (loss) on product			<u>\$(70)</u>

Required:

- From the point of view of Quest Computers, should transfers be made to the Personal Computer Division if there is no excess capacity in the Microprocessor Division? Is the market price the correct transfer price?
- Assume that the Microprocessor Division has the capacity to make 50,000 chips, and it can sell only 37,500 chips to the outside market at a price of \$250 (assume for various reasons, the division is not willing to reduce this price). From the point of view of Quest Computers, should the remaining 12,500 chips be transferred to the Personal Computer Division?
- Suppose the Microprocessor Division can sell all 50,000 chips if it reduces the market price to \$225. From the point of view of Quest Computers, should transfers be made to the Personal Computer Division? If yes, is market price the correct transfer price?

12.59 ROI Computations (LO4). Tom and Lynda have approached you for clarification regarding how to compute return on investment. They inform you that their operating profit is \$125,000 per year. Their accountant’s statement contained a calculation of ROI based on \$900,000, the net book value of their investment in Hercules. However, Tom feels that net book value is a poor measure of their return. He argues that it will take at least \$1,250,000 to replace their machines and that estimate is better for figuring out what they have vested in the business. Lynda argues that even that estimate is too low. She says that they can sell the gym for about \$1.7 million, mostly because the land has appreciated a great deal in their neighborhood.



Required:

Calculate the ROI for Hercules using the three estimates for investment. Which measure do you support? If different measures are useful for differing decisions, identify a context for each of the three values of ROI.

12.60 Economic value added (LO4). Refer to the following table:



	<i>Net Operating Profit after Taxes (NOPAT)</i>	<i>Invested Capital</i>	<i>Current Liabilities</i>	<i>Cost of Debt (k_D)</i>	<i>Cost of Equity Capital (k_E)</i>	<i>Proportion of Debt in Total Capital (d)</i>	<i>WACC</i>	<i>EVA</i>
1	\$200,000	\$1,600,000	\$150,000	8%	12%	0.75	?	?
2	\$200,000	\$1,600,000	\$150,000	8%	12%	0.5	?	?
3	\$200,000	\$1,600,000	\$350,000	8%	12%	0.5	9%	?

The weighted average cost of capital is given by $WACC = (1 - t) \times d \times k_D + (1 - d) \times k_E$, where t is the tax rate. Assume a tax rate of 25 percent.

Required:

Treating each row of the table independently, compute the missing information. What inferences can you draw by comparing your answers across rows (note that each row changes one or two items relative to the row above it).

MINI-CASES



12.61 Project appraisal and selection, ROI (LO4). Kitchen Appliances, Inc., is a multidivision company with each major product line managed by a separate division. Divisional managers have complete autonomy with respect to operating and investment decisions. The company evaluates its division managers on ROI, calculated as operating income before taxes divided by net book value of assets (averaged over the year). The firm pays particular attention to year-over-year growth in ROI as well as budget-actual comparison of the measure.

Wendy Miller is the manager of the dishwasher division. Wendy expects that the operating income for the current year will be \$2,400,000 before taxes. Given a net asset base of \$6,800,000, the division’s ROI would be a healthy 35%, well above the average return from other divisions. This performance has been fairly representative of the way things have been going for Wendy. She expects a similar performance next year as well and is looking forward to her promotion into the C-suite (the corporate office).

Toward the end of the current year, an investment opportunity arises for Wendy—the possibility of introducing a new dishwasher model with improved features. The following table presents some salient financial information that Wendy’s managers put together for her evaluation:

Incremental cash outlay for additional equipment	\$1,500,000
Useful life	10 years
Salvage value at the end of useful life	0
Annual revenues	800,000
Annual variable costs	300,000
Annual fixed costs (excluding depreciation)	100,000
Required rate of return (company stipulated)	12%
Corporate tax rate	30%

The company uses a straight-line depreciation method for accounting and tax purposes.

Required:

- a. Does the investment opportunity have a positive net present value? From the company’s viewpoint, should the project be accepted?
- b. Will Wendy accept the project? Make a recommendation after calculating her ROI with and without the investment. Assume that investment occurs at the start of the year.
- c. Assume that the company evaluates its divisional managers based on residual income, using a 12% required rate of return. What is the dishwasher division’s expected residual income for the current year (without the proposed investment)? With the proposed project?
- d. Comment on why ROI and RI might lead to differing incentives regarding project investments.



12.62 Decentralization and Performance Evaluation (LO1, LO2, LO3, LO4). Anne Green leveraged her love of plants and gardens into a highly acclaimed garden shop. Over the past 20 years, the business expanded rapidly and now operates in 14 states.

Anne firmly believes in giving people a free hand but exercising careful control as well. She likens managing people to growing gardens. “Once you give them the necessary tools for success and have helped through the initial growth, it is best to step aside to let them grow and thrive. But you must be prepared to pinch and prune for the best long-term results.” Thus, while seen as a place that values autonomy, Annie’s Gardens also has a reputation for strongly linking compensation to performance. The following describes some key aspects of the firm.

- *Strategy:* Annie believes that a small outfit like hers cannot compete in the mass market. She therefore wishes to focus on hard to find and exotic plants, as well as plants that are perceived as “more healthy and better cared for” than a customer might find at a general store. She thinks that there is a viable market (comprising

middle- to upper-income households) that will pay premium prices for unique and vibrant plants that will distinguish their homes. She also feels that providing good advice (and some hand holding) is the first step when selling plants. She has accordingly expanded into garden design and renovation. However, she thinks that Annie's should play the role of a designer and supplier and hire out the actual work of making the garden.

- *Structure:* Annie's Gardens is organized into three regions—Midwest, Mid-Atlantic, and North East—each with about 20 to 30 branches. Each store has a manager and an assistant manager, who make most decisions. Many stores have one to two additional permanent employees. Stores also hire people for the season and pay them by the hour.
- *Sales:* While the central office suggests pricing for most categories of items (e.g., small shrubs for \$39.99, medium for \$59.99), managers are allowed to change prices to reflect local market conditions. Store managers can also design and execute targeted promotions. There is little in the form of national or regional-level advertising.
- *Purchasing:* Virtually all purchasing is centralized. Annie's negotiates prices with major growers and suppliers (e.g., for seed, fertilizer, and so on). She then circulates a list of all available plants and supplies to her stores, highlighting items that she believes have the greatest margins and are likely to “do well” this year. However, store managers and their purchasing associates (who often become managers themselves) determine what to buy and the quantities to stock. Returns, particularly of plants, are expensive to process and strongly discouraged. In practice, stores discount prices heavily to move seasonal and perishable merchandise.
- *Personnel:* The manager also is responsible for virtually all hiring, pay scales, and other decisions regarding personnel. Pay rates are negotiated locally. There is some movement of managers across stores, although it is unusual for a manager to be moved involuntarily.
- *Operations:* While the central office provides guidelines, individual store managers control store hours. They also are responsible for upkeep (e.g., making sure that the plants are watered appropriately), display, and so on. Periodic, unannounced visits (about once a month at least, with more to “problem” stores) ensure that the store meets “corporate quality standards.” These standards are not spelled out but represent an informal understanding about the level of cleanliness, responsiveness to customer enquiries, and so on.
- *Investments:* Anne is very careful about this aspect. Any capital improvement over \$1,000 must be personally approved by her. She is somewhat vague about her approval criteria, although her impressions about the store's prospects and its manager seem to matter a lot. After getting her MBA, she has begun to demand financial measures when managers submit investment proposals.
- *Store manager compensation:* Managers receive a base pay plus a cash bonus. The bonus formula considers the budgeted and actual return on investment (ROI) for the store. ROI is calculated as income over investment, with income defined as operating income (i.e., before taxes and finance charges). Investment includes all assets (land, buildings, equipment, and inventory are the prominent items) valued at net book value, averaged over the start and end of the year.

The bonus is based on a sliding scale. The manager earns no bonus if the actual ROI is less than 90% of budgeted ROI. At this cutoff, the manager gets an adjustment factor of $0.9 \times$ bonus pool rate for the year \times base salary. The adjustment factor increases linearly to be 1.00 when actual ROI equals budgeted ROI, and it tops out at 1.2. The bonus pool is decided at the regional level, based on both corporate and regional performance, and the bonus pool rate is calculated as the ($\$$ in the bonus pool/total salary for bonus-eligible employees). In many cases, the bonus is nearly 50% of the manager's annual compensation.

The Situation at the Columbus Store:

Don Moser has been the manager of the Columbus store for all five years of its existence. The grapevine says that Don is likely to become region chief, when the incumbent retires in two to three years. Six months into this year, Don is projecting an ROI of 28% based on income of \$92,400 and assets of \$330,000 (averaged as \$340,000 and \$320,000 for the opening and closing values). His target ROI for the year is 25%.

The Proposal:

His second-in-command and probable successor, Deborah, has approached Don with an intriguing idea. She wants to spend \$20,000 to make a specialty greenhouse that will allow the store to stock a greater variety of exotics as well as reduce the “shrinkage” (e.g., dead plants) due to adverse weather conditions. She estimates (and Don agrees) that the greenhouse would increase sales by about \$17,500 during the first year but that sales would increase by 12% each year after that. Sales for the remainder of the current year would be \$8,500. The greenhouse would cost \$2,500 annually to operate and would last five full years (not counting the current year) without the need for substantial renovation.

Annie’s usual contribution margin ratio is 50%. The firm would depreciate the greenhouse over five years and use straight-line depreciation. The current year (and the last year) will have half the normal depreciation. The required rate of return (pretax) is 20%.

Required:

- a. What is Anne’s implicit classification of stores (as cost/profit or investment centers). Do you agree with this classification?
- b. Deborah calculates that the greenhouse has an NPV of \$7,434 before considering taxes, and that its payback period is just under three years. However, Don does not seem eager to forward the proposal to Anne for her approval. What might be a source of his reluctance? (*Note:* You might wish to verify these estimates. For simplicity, assume that all cash flow, including those for the current year, take place at the end of the year. Also calculate the NPV as at the end of the current year. Verification is not needed to answer the question.)
- c. Critically evaluate the choice of ROI as a performance metric and the way in which Annie’s Gardens computes the measure. In particular, should Annie include or exclude some items when computing income or investment? Should she value them differently? What are the costs and benefits of using alternate measures such as residual income in place of ROI?
- d. Discuss the structure of the compensation plan. What might be reasons for starting the bonus at levels below the target? for a cap on the payout ratio? for computing the bonus pool at the regional level?

12.63 Transfer Pricing (LO4, LO5, Appendix)

Brenda: Seth, I am trying to help you here. But there is no way that I can pay you \$230 per unit. I have competitive bids from other vendors for about \$170, and that difference means \$1,200,000 in my bottom line. Because you helped me design the part, I am willing to split the difference and offer \$200. This will help you ramp up your utilization and spread your fixed costs over a larger base. After all, we play for the same team, but there is a limit to the hit I can take.

Seth: I can do without help like that! I have been screaming at my sales guys to get full cost plus 15%, which is what I quoted you. I drew this line in the sand six months ago, and slowly but steadily it is paying off. I will be undercutting my own instructions if I give you the part for what you are asking. At \$200, I barely break even and only if I eat the \$240,000 I spent in designing the part and making mock-ups. Already, morale is low because we did not make bonus last year. Pricing at cost is a sure way for not making it this year as well.

Seth and Brenda are division managers for a large manufacturing firm that makes many different kinds of appliances. The firm operates on a decentralized basis, and division managers have considerable autonomy in pricing and sourcing. They also are held accountable for meeting divisional goals, usually set at stretch levels. Bonus compensation heavily weights divisional performance, although a portion (e.g., stock options) depends on corporate performance.

The highlighted dispute centers on an innovative part that Seth’s components division had designed in collaboration with Brenda’s refrigerator division. While there was no payment for the design, the intent was that Seth’s outfit would be the front-runner in the bidding. However, Seth’s bid of \$230 per unit (for 20,000 parts annually) was substantially above other bids. The conversation excerpted above summarizes the heated exchange between the two managers.

Brenda is annoyed because she thinks she is doing Seth a favor and that he is looking a gift horse in the mouth. She knows that his division is operating at about 70% of capacity only and that his sales force is scrambling to find orders. This component would substantially increase Seth's utilization. Brenda also has a desire to keep the relationship alive because Seth's engineers have proved adept at solving thorny technical issues and his quality is decidedly better than that provided by his competitors.

Seth is upset too. He knows that Brenda would have paid for the design anywhere else. Moreover, he thinks that she saves a bundle with higher component quality. He points out that 15% is the average long-run rate of return for his segment of the industry. For his coup d'état, he whips out an accounting statement that shows the component's variable manufacturing cost at \$125 and allocated manufacturing overhead at \$75 per part. He even ignored selling expenses (usually 10% of selling price) when arriving at the bid! He is planning to appeal to their joint boss to force Brenda to buy the part at \$230.

Required:

- a. Relative to buying for an outside supplier at \$170 per unit, calculate the change in the profit reported by Seth's division and the firm as a whole if Brenda buys the component from Seth for \$170 per unit. Repeat at prices of \$200 and \$230 per unit. Ignore any savings in Brenda's plant due to higher quality.
- b. What advice would you provide the corporate VP, who has Brenda and Seth as her direct reports? When formulating your recommendation, please be sure to consider Seth and Brenda's motivations for their respective stance.