

► Learning Objectives

1. Describe a management control system and its three key properties
2. Describe the benefits and costs of decentralization
3. Explain transfer prices and four criteria used to evaluate alternative transfer-pricing methods
4. Illustrate how market-based transfer prices promote goal congruence in perfectly competitive markets
5. Understand how to avoid making suboptimal decisions when transfer prices are based on full cost plus a markup
6. Describe the range of feasible transfer prices when there is unused capacity
7. Apply a general guideline for determining a minimum transfer price
8. Incorporate income tax considerations in multinational transfer pricing

Transfer pricing is the price one subunit of a company charges for the services it provides another subunit of the same company.

Top management uses transfer prices (1) to focus managers' attention on the performance of their own subunits and (2) to plan and coordinate the actions of different subunits to maximize the company's income as a whole. While transfer pricing is productive, it can also be contentious, because managers of different subunits often have very different preferences about how transfer prices should be set. For example, some managers prefer the prices be based on market prices. Others prefer the prices be based on costs alone. Controversy also arises when multinational corporations seek to reduce their overall income tax burden by charging high transfer prices to units located in countries with high tax rates. Many countries, including the United States, attempt to restrict this practice, as the following article shows.

Symantec Wins \$545 million Opinion in Transfer Pricing Dispute with the IRS¹

Symantec Corp., a large U.S. software company, won a significant court decision in December 2009, potentially saving it \$545 million in contested back taxes. The Internal Revenue Service (IRS) had been seeking back taxes it alleged were owed by Veritas Software Corp., a company acquired by Symantec in 2005. The dispute was over the company's formula for "transfer pricing," a complex set of rules determining how companies set prices, fees, and cost-allocation arrangements between their operations in different tax jurisdictions.

At issue were the fees and cost-allocation arrangements between Veritas and its Irish subsidiary. Ireland has emerged as a popular tax haven for U.S. technology companies. Veritas granted rights to Veritas Ireland to conduct research and development on various intangibles (such as computer programs and manufacturing process technologies) related to data storage software and related devices. Under the agreement in effect, Veritas Ireland paid \$160 million for this grant of rights from 1999 to 2001. Based on a discounted cash flow analysis, the IRS contended that the true value of the transferred rights was closer to \$1.675 billion. As a consequence, it claimed that the transaction artificially increased the income of Veritas Ireland at the

¹ Source: Chinnis, Cabell et al. 2009. Tax court upends IRS's billion dollar buy-in valuation adjustment in "Veritas." Mondaq Business Briefing, December 17; Letzing, John. 2009. Symantec wins \$545M opinion in tax case. *Dow Jones News Service*, December 11.

expense of income in the U.S. parent corporation, consequently lowering the U.S. tax bills during this period.

Veritas, however, maintained that it acted appropriately. The company testified that the \$160 million figure was based on royalty rates it had received from seven original equipment manufacturers (OEMs) for rights to incorporate Veritas United States' software and technologies into an operating system, with adjustments made for purposes of comparability. At trial, the United States Tax Court supported this position, and called the IRS's valuation of the intangibles "arbitrary, capricious, and unreasonable." Among other things, the court took issue with the discount and growth rates used in the IRS expert's analysis, and disagreed with his assumption that the transferred intangibles had a perpetual useful life.

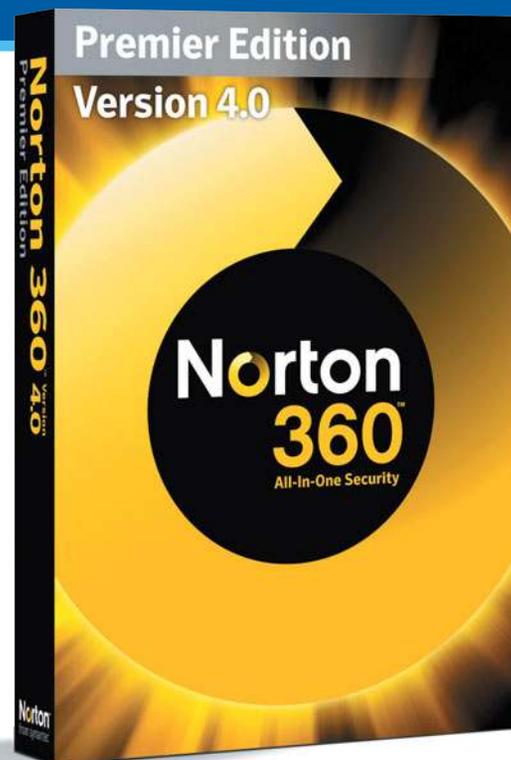
Though not all companies face multinational tax concerns, transfer-pricing issues are common to many companies. In these companies, transfer pricing is part of the larger management control system. This chapter develops the links among strategy, organization structure, management control systems, and accounting information. We'll examine the benefits and costs of centralized and decentralized organization structures, and we'll look at the pricing of products or services transferred between subunits of the same company. We emphasize how accounting information, such as costs, budgets, and prices, helps in planning and coordinating actions of subunits.

Management Control Systems

A **management control system** is a means of gathering and using information to aid and coordinate the planning and control decisions throughout an organization and to guide the behavior of its managers and other employees. Some companies design their management control system around the concept of the balanced scorecard. For example, ExxonMobil's management control system contains financial and nonfinancial information in each of the four perspectives of the balanced scorecard (see Chapter 13 for details). Well-designed management control systems use information both from within the company, such as net income and employee satisfaction, and from outside the company, such as stock price and customer satisfaction.

Formal and Informal Systems

Management control systems consist of formal and informal control systems. The formal management control system of a company includes explicit rules, procedures, performance measures, and incentive plans that guide the behavior of its managers and other employees. The formal control system is comprised of several systems, such as the



Learning Objective 1

Describe a management control system

... gathers information for planning and control decisions

and its three key properties

... aligns with strategy, supports organizational responsibility of managers, and motivates employees

management accounting system, which provides information regarding costs, revenues, and income; the human resources systems, which provide information on recruiting, training, absenteeism, and accidents; and the quality systems, which provide information on yield, defective products, and late deliveries to customers.

The informal management control system includes shared values, loyalties, and mutual commitments among members of the organization, company culture, and the unwritten norms about acceptable behavior for managers and other employees. Examples of company slogans that reinforce values and loyalties are “At Ford, Quality Is Job 1,” and “At Home Depot, Low Prices Are Just the Beginning.”

Effective Management Control

To be effective, management control systems should be closely aligned with the organization’s strategies and goals. Two examples of strategies at ExxonMobil are (1) providing innovative products and services to increase market share in key customer segments (by targeting customers who are willing to pay more for faster service, better facilities, and well-stocked convenience stores) and (2) reducing costs and targeting price-sensitive customers. Suppose ExxonMobil decides to pursue the former strategy. The management control system must then reinforce this goal, and ExxonMobil should tie managers’ rewards to achieving the targeted measures.

Management control systems should also be designed to support the organizational responsibilities of individual managers. Different levels of management at ExxonMobil need different kinds of information to perform their tasks. For example, top management needs stock-price information to evaluate how much shareholder value the company has created. Stock price, however, is less important for line managers supervising individual refineries. They are more concerned with obtaining information about on-time delivery of gasoline, equipment downtime, product quality, number of days lost to accidents and environmental problems, cost per gallon of gasoline, and employee satisfaction. Similarly, marketing managers are more concerned with information about service at gas stations, customer satisfaction, and market share.

Effective management control systems should also motivate managers and other employees. **Motivation** is the desire to attain a selected goal (the *goal-congruence* aspect) combined with the resulting pursuit of that goal (the *effort* aspect).

Goal congruence exists when individuals and groups work toward achieving the organization’s goals—that is, managers working in their own best interest take actions that align with the overall goals of top management. Suppose the goal of ExxonMobil’s top management is to maximize operating income. If the management control system evaluates the refinery manager *only* on the basis of costs, the manager may be tempted to make decisions that minimize cost but overlook product quality or timely delivery to retail stations. This oversight is unlikely to maximize operating income of the company as a whole. In this case, the management control system will not achieve goal congruence.

Effort is the extent to which managers strive or endeavor in order to achieve a goal. Effort goes beyond physical exertion, such as a worker producing at a faster rate, to include mental actions as well. For example, effort includes the diligence or acumen with which a manager gathers and analyzes data before authorizing a new investment. It is impossible to directly observe or reward effort. As a result, management control systems motivate employees to exert effort by rewarding them for the achievement of observable goals, such as profit targets or stock returns. This induces managers to exert effort because higher levels of effort increase the likelihood that the goals are achieved. The rewards can be monetary (such as cash, shares of company stock, use of a company car, or membership in a club) or nonmonetary (such as a better title, greater responsibility, or authority over a larger number of employees).

Decision Point

What is a management control system and how should it be designed?

Decentralization

Management control systems must fit an organization’s structure. An organization whose structure is decentralized has additional issues to consider for its management control system to be effective.

Decentralization is the freedom for managers at lower levels of the organization to make decisions. **Autonomy** is the degree of freedom to make decisions. The greater the freedom, the greater the autonomy. As we discuss the issues of decentralization and autonomy, we use the term “subunit” to refer to any part of an organization. A subunit may be a large division, such as the refining division of ExxonMobil, or a small group, such as a two-person advertising department of a local clothing chain.

Until the mid-twentieth century, many firms were organized in a centralized, hierarchical fashion. Power was concentrated at the top and there was relatively little freedom for managers at the lower levels to make decisions. Perhaps the most famous example of a highly centralized structure is the Soviet Union, prior to its collapse in the late 1980s. Today, organizations are far more decentralized and many companies have pushed decision-making authority down to subunit managers. Examples of firms with decentralized structures include Nucor, the U.S. steel giant, which allows substantial operational autonomy to the general managers of its plants, and Tesco, Britain’s largest retailer, which offers great latitude to its store managers. Of course, no firm is completely decentralized. At Nucor headquarters management still retains responsibility for overall strategic planning, company financing, setting base salary levels and bonus targets, purchase of steel scrap, etc. How much decentralization is optimal? Companies try to choose the degree of decentralization that maximizes benefits over costs. From a practical standpoint, top management can seldom quantify either the benefits or the costs of decentralization. Still, the cost-benefit approach helps management focus on the key issues.

Benefits of Decentralization

Supporters of decentralizing decision making and granting responsibilities to managers of subunits advocate the following benefits:

1. **Creates greater responsiveness to needs of a subunit’s customers, suppliers, and employees.** Good decisions cannot be made without good information. Compared with top managers, subunit managers are better informed about their customers, competitors, suppliers, and employees, as well as about local factors that affect performance, such as ways to decrease costs, improve quality, and be responsive to customers. Eastman Kodak reports that two advantages of decentralization are an “increase in the company’s knowledge of the marketplace and improved service to customers.”
2. **Leads to gains from faster decision making by subunit managers.** Decentralization speeds decision making, creating a competitive advantage over centralized organizations. Centralization slows decision making as responsibility for decisions creeps upward through layer after layer of management. Interlake, a manufacturer of materials handling equipment, cites this benefit of decentralization: “We have distributed decision-making powers more broadly to the cutting edge of product and market opportunity.” Interlake’s materials-handling equipment must often be customized to fit customers’ needs. Delegating decision making to the sales force allows Interlake to respond faster to changing customer requirements.
3. **Increases motivation of subunit managers.** Subunit managers are more motivated and committed when they can exercise initiative. Hawei & Hawei, a highly decentralized company, maintains that “Decentralization = Creativity = Productivity.”
4. **Assists management development and learning.** Giving managers more responsibility helps develop an experienced pool of management talent to fill higher-level management positions. The company also learns which people are unlikely to be successful top managers. According to Tektronix, an electronics instruments company, “Decentralized units provide a training ground for general managers and a visible field of combat where product champions can fight for their ideas.”
5. **Sharpens the focus of subunit managers, broadens the reach of top management.** In a decentralized setting, the manager of a subunit has a concentrated focus. The head of Yahoo Japan, for example, can develop country-specific knowledge and expertise (local advertising trends, cultural norms, payment forms, etc.) and focus attention on maximizing Yahoo’s profits in Japan. At the same time, this relieves Yahoo’s top

Learning Objective 2

Describe the benefits of decentralization

... responsiveness to customers, faster decision making, management development

and the costs of decentralization

... loss of control, duplication of activities

management in Sunnyvale, CA from the burden of controlling day-to-day operating decisions in Japan. The American managers can now spend more time and effort on strategic planning for the entire organization.

Costs of Decentralization

Advocates of more-centralized decision making point to the following costs of decentralizing decision making:

1. **Leads to suboptimal decision making.** This cost arises because top management has given up control over decision making. If the subunit managers do not have the necessary expertise or talent to handle this responsibility, the company, as a whole, is worse off.
Even if subunit managers are sufficiently skilled, **suboptimal decision making**—also called **incongruent decision making** or **dysfunctional decision making**—occurs when a decision's benefit to one subunit is more than offset by the costs to the organization as a whole. This is most prevalent when the subunits in the company are highly interdependent, such as when the end product of one subunit is used or sold by another subunit. For example, suppose that Nintendo's marketing group receives an order for additional Wii consoles in Australia following the release of some unexpectedly popular new games. A manufacturing manager in Japan who is evaluated on the basis of costs may be unwilling to arrange this rush order since altering production schedules invariably increases manufacturing costs. From Nintendo's viewpoint, however, supplying the consoles may be optimal, both because the Australian customers are willing to pay a premium price and because the current shipment is expected to stimulate orders for other Nintendo games and consoles in the future.
2. **Focuses manager's attention on the subunit rather than the company as a whole.** Individual subunit managers may regard themselves as competing with managers of other subunits in the same company as if they were external rivals. This pushes them to view the relative performance of the subunit as more important than the goals of the company. Consequently, managers may be unwilling to assist when another subunit faces an emergency (as in the Nintendo example) or share important information. In the recent Congressional hearings on the recall of Toyota vehicles, it was revealed that it was common for Toyota's Japan unit to not share information about engineering problems or reported defects between its United States, Asian, and European operations. Toyota has since asserted that this dysfunctional behavior will no longer be tolerated.
3. **Results in duplication of output.** If subunits provide similar products or services, their internal competition could lead to failure in the external markets. The reason is that divisions may find it easier to steal market share from one another, by mimicking each other's successful products, rather than from outside firms. Eventually, this leads to confusion in the minds of customers, and the loss of each division's distinctive strengths. The classic example is General Motors, which has had to wind down its Oldsmobile, Pontiac, and Saturn divisions and is now in bankruptcy reorganization. Similarly, Condé Nast Publishing's initially distinct (and separately run) food magazines, *Bon Appétit* and *Gourmet*, eventually ended up chasing the same readers and advertisers, to the detriment of both. *Gourmet* magazine stopped publication in November 2009.²
4. **Results in duplication of activities.** Even if the subunits operate in distinct markets, several individual subunits of the company may undertake the same activity separately. In a highly decentralized company, each subunit may have personnel to carry out staff functions such as human resources or information technology. Centralizing these functions helps to streamline and use fewer resources for these activities, and eliminates wasteful duplication. For example, ABB (Switzerland), a global leader in power and automation technology, is decentralized but has generated significant cost savings of late by centralizing its sourcing decisions across business units for parts, such as pipe pumps and fittings, as well as engineering and erection services. The

² For an intriguing comparison of the failure of decentralization in these disparate settings, see Jack Shafer's article, "How Condé Nast is Like General Motors: The Magazine Empire as Car Wreck," *Slate*, October 5, 2009, www.slate.com/id/2231177/.

growing popularity of the “shared service center” model, especially for financial transactions and human resources, is predicated on the 30%–40% savings enabled by the consolidation of such functions, rather than allowing them to be controlled by the subunits.³

Comparison of Benefits and Costs

To choose an organization structure that will implement a company’s strategy, top managers must compare the benefits and costs of decentralization, often on a function-by-function basis. Surveys of U.S. and European companies report that the decisions made most frequently at the decentralized level are related to product mix and product advertising. In these areas, subunit managers develop their own operating plans and performance reports and make faster decisions based on local information. Decisions related to the type and source of long-term financing and income taxes are made least frequently at the decentralized level. Corporate managers have better information about financing terms in different markets and can obtain the best terms. Centralizing income tax strategies allows the organization to trade off and manage income in a subunit with losses in others. The benefits of decentralization are generally greater when companies face uncertainties in their environments, require detailed local knowledge for performing various jobs, and have few interdependencies among divisions.

Decentralization in Multinational Companies

Multinational companies—companies that operate in multiple countries—are often decentralized because centralized control of a company with subunits around the world is often physically and practically impossible. Also, language, customs, cultures, business practices, rules, laws, and regulations vary significantly across countries. Decentralization enables managers in different countries to make decisions that exploit their knowledge of local business and political conditions and enables them to deal with uncertainties in their individual environments. For example, Philips, a global electronics company headquartered in the Netherlands, delegates marketing and pricing decisions for its television business in the Indian and Singaporean markets to the managers in those countries. Multinational corporations often rotate managers between foreign locations and corporate headquarters. Job rotation combined with decentralization helps develop managers’ abilities to operate in the global environment.

There are drawbacks to decentralizing multinational companies. One of the most important is the lack of control and the resulting risks. Barings PLC, a British investment banking firm, went bankrupt and had to be sold when one of its traders in Singapore caused the firm to lose more than £1 billion on unauthorized trades that were not detected until after the trades were made. Similarly, a trader at Sumitomo Corporation racked up \$2.6 billion in copper-trading losses because poor controls failed to detect the magnitude of the trader’s activities. Multinational corporations that implement decentralized decision making usually design their management control systems to measure and monitor division performance. Information and communications technology helps the flow of information for reporting and control.

Choices About Responsibility Centers

Recall from Chapter 6 that a responsibility center is a segment or subunit of the organization whose manager is accountable for a specified set of activities. To measure the performance of subunits in centralized or decentralized companies, the management control system uses one or a mix of the four types of responsibility centers:

1. *Cost center*—the manager is accountable for costs only.
2. *Revenue center*—the manager is accountable for revenues only.
3. *Profit center*—the manager is accountable for revenues and costs.
4. *Investment center*—the manager is accountable for investments, revenues, and costs.

Centralization or decentralization is not mentioned in the descriptions of these centers because each type of responsibility center can be found in either centralized or decentralized companies.

³ For more on this topic, see http://www.sap.com/solutions/business-suite/erp/pdf/BWP_WP_Shared_Services.pdf.

Decision Point

What are the benefits and costs of decentralization?

A common misconception is that *profit center*—and, in some cases, *investment center*—is a synonym for a decentralized subunit, and *cost center* is a synonym for a centralized subunit. *Profit centers can be coupled with a highly centralized organization, and cost centers can be coupled with a highly decentralized organization.* For example, managers in a division organized as a profit center may have little freedom in making decisions. They may need to obtain approval from corporate headquarters for introducing new products and services, or to make expenditures over some preset limit. When Michael Eisner ran Walt Disney Co., the giant media and entertainment conglomerate, the strategic-planning division applied so much scrutiny to business proposals that managers were reluctant to even pitch new ideas.⁴ In other companies, divisions such as Information Technology may be organized as cost centers, but their managers may have great latitude with regard to capital expenditures and the purchase of materials and services. In short, the labels “profit center” and “cost center” are independent of the degree of centralization or decentralization in a company.

Transfer Pricing

In decentralized organizations, much of the decision-making power resides in its individual subunits. In these cases, the management control system often uses *transfer prices* to coordinate the actions of the subunits and to evaluate their performance.

As you may recall from the opener, a **transfer price** is the price one subunit (department or division) charges for a product or service supplied to another subunit of the same organization. If, for example, a car manufacturer has a separate division that manufactures engines, the transfer price is the price the engine division charges when it transfers engines to the car assembly division. The transfer price creates revenues for the selling subunit (the engine division in our example) and purchase costs for the buying subunit (the assembly division in our example), affecting each subunit’s operating income. These operating incomes can be used to evaluate subunits’ performances and to motivate their managers. The product or service transferred between subunits of an organization is called an **intermediate product**. This product may either be further worked on by the receiving subunit (as in the engine example) or, if transferred from production to marketing, sold to an external customer.

In one sense, transfer pricing is a curious phenomenon. Activities within an organization are clearly nonmarket in nature; products and services are not bought and sold as they are in open-market transactions. Yet, establishing prices for transfers among subunits of a company has a distinctly market flavor. The rationale for transfer prices is that subunit managers (such as the manager of the engine division), when making decisions, need only focus on how their decisions will affect their subunit’s performance without evaluating their impact on company-wide performance. In this sense, transfer prices ease the subunit managers’ information-processing and decision-making tasks. In a well-designed transfer-pricing system, a manager focuses on optimizing subunit performance (the performance of the engine division) and in so doing optimizes the performance of the company as a whole.

Criteria for Evaluating Transfer Prices

As in all management control systems, transfer prices should help achieve a company’s strategies and goals and fit its organization structure. We describe four criteria to evaluate transfer pricing: (1) Transfer prices should promote goal congruence. (2) They should induce managers to exert a high level of effort. Subunits selling a product or service should be motivated to hold down their costs; subunits buying the product or service should be motivated to acquire and use inputs efficiently. (3) The transfer price should help top management evaluate the performance of individual subunits. (4) If top management favors a high degree of decentralization, transfer prices should preserve a high degree of subunit autonomy in decision making. That is, a subunit manager seeking to maximize the operating income of the subunit should have the freedom to transact with other subunits of the company (on the basis of transfer prices) or to transact with external parties.

⁴ When Robert Iger replaced Eisner as CEO in 2005, one of his first acts was to disassemble the strategic-planning division, thereby giving more authority to Disney’s business units (parks and resorts, consumer products, and media networks).

Learning Objective 3

Explain transfer prices

... price one subunit charges another for product

and four criteria used to evaluate alternative transfer-pricing methods

... goal congruence, management effort, subunit performance evaluation, and subunit autonomy

Calculating Transfer Prices

There are three broad categories of methods for determining transfer prices. They are as follows:

1. **Market-based transfer prices.** Top management may choose to use the price of a similar product or service publicly listed in, say, a trade association Web site. Also, top management may select, for the internal price, the external price that a subunit charges to outside customers.
2. **Cost-based transfer prices.** Top management may choose a transfer price based on the cost of producing the product in question. Examples include variable production cost, variable and fixed production costs, and full cost of the product. Full cost of the product includes all production costs plus costs from other business functions (R&D, design, marketing, distribution, and customer service). The cost used in cost-based transfer prices can be actual cost or budgeted cost. Sometimes, the cost-based transfer price includes a markup or profit margin that represents a return on subunit investment.
3. **Hybrid transfer prices.** Hybrid transfer prices take into account both cost and market information. Top management may administer such prices, for example by specifying a transfer price that is an average of the cost of producing and transporting the product internally and the market price for comparable products. At other times, a hybrid transfer price may take the form where the revenue recognized by the selling unit is different from the cost recognized by the buying unit. The most common form of hybrid prices arise via negotiation—the subunits of a company are asked to negotiate the transfer price between them and to decide whether to buy and sell internally or deal with external parties. The eventual transfer price is then the outcome of a bargaining process between selling and buying subunits. Even though there is no requirement that the chosen transfer price bear any specific relationship to cost or market-price data, information regarding costs and prices plays a critical role in the negotiation process. Negotiated transfer prices are often employed when market prices are volatile and change constantly.

To see how each of the three transfer-pricing methods works and to see the differences among them, we examine transfer pricing at Horizon Petroleum against the four criteria of promoting goal congruence, motivating management effort, evaluating subunit performance, and preserving subunit autonomy (if desired).

An Illustration of Transfer Pricing

Horizon Petroleum has two divisions, each operating as a profit center. The transportation division purchases crude oil in Matamoros, Mexico, and transports it from Matamoros to Houston, Texas. The refining division processes crude oil into gasoline. For simplicity, we assume gasoline is the only salable product the Houston refinery makes and that it takes two barrels of crude oil to yield one barrel of gasoline.

Variable costs in each division are variable with respect to a single cost driver: barrels of crude oil transported by the transportation division, and barrels of gasoline produced by the refining division. The fixed cost per unit is based on the budgeted annual fixed costs and practical capacity of crude oil that can be transported by the transportation division, and the budgeted fixed costs and practical capacity of gasoline that can be produced by the refining division. Horizon Petroleum reports all costs and revenues of its non-U.S. operations in U.S. dollars using the prevailing exchange rate.

- The transportation division has obtained rights to certain oil fields in the Matamoros area. It has a long-term contract to purchase crude oil produced from these fields at \$72 per barrel. The division transports the oil to Houston and then “sells” it to the refining division. The pipeline from Matamoros to Houston has the capacity to carry 40,000 barrels of crude oil per day.
- The refining division has been operating at capacity (30,000 barrels of crude oil a day), using oil supplied by Horizon’s transportation division (an average of 10,000 barrels per day) and oil bought from another producer and delivered to the Houston refinery (an average of 20,000 barrels per day at \$85 per barrel).
- The refining division sells the gasoline it produces to outside parties at \$190 per barrel.

Exhibit 22-2

Division Operating Income of Horizon Petroleum for 100 Barrels of Crude Oil Under Alternative Transfer-Pricing Methods

	A	B	C	D	E	F	G	H
1	Production and Sales Data							
2	Barrels of crude oil transferred =	100						
3	Barrels of gasoline sold =	50						
4								
5		Internal Transfers at			Internal Transfers at			
6		Market Price =			105% of Full Cost =		Hybrid Price =	
7		\$85 per Barrel			\$79.80 per Barrel		\$82 per Barrel	
8	Transportation Division							
9	Revenues, \$85, \$79.80, \$82 × 100 barrels of crude oil	<u>\$8,500</u>			<u>\$7,980</u>		<u>\$8,200</u>	
10	Costs							
11	Crude oil purchase costs, \$72 × 100 barrels of crude oil	7,200			7,200		7,200	
12	Division variable costs, \$1 × 100 barrels of crude oil	100			100		100	
13	Division fixed costs, \$3 × 100 barrels of crude oil	<u>300</u>			<u>300</u>		<u>300</u>	
14	Total division costs	<u>7,600</u>			<u>7,600</u>		<u>7,600</u>	
15	Division operating income	<u>\$ 900</u>			<u>\$ 380</u>		<u>\$ 600</u>	
16								
17	Refining Division							
18	Revenues, \$190 × 50 barrels of gasoline	<u>\$9,500</u>			<u>\$9,500</u>		<u>\$9,500</u>	
19	Costs							
20	Transferred-in costs, \$85, \$79.80, \$82							
21	× 100 barrels of crude oil	8,500			7,980		8,200	
22	Division variable costs, \$8 × 50 barrels of gasoline	400			400		400	
23	Division fixed costs, \$6 × 50 barrels of gasoline	<u>300</u>			<u>300</u>		<u>300</u>	
24	Total division costs	<u>9,200</u>			<u>8,680</u>		<u>8,900</u>	
25	Division operating income	<u>\$ 300</u>			<u>\$ 820</u>		<u>\$ 600</u>	
26	Operating income of both divisions together	<u>\$1,200</u>			<u>\$1,200</u>		<u>\$1,200</u>	

income the same, we focus attention on the effects of different transfer-pricing methods on the operating income of each division. Subsequent sections of this chapter show that different transfer-pricing methods can cause managers to take different actions leading to different total operating incomes.

Consider the two methods in the first two columns of Exhibit 22-2. The operating income of the transportation division is \$520 more (\$900 – \$380) if transfer prices are based on market prices rather than on 105% of full cost. The operating income of the refining division is \$520 more (\$820 – \$300) if transfer prices are based on 105% of full cost rather than market prices. If the transportation division's sole criterion were to maximize its own division operating income, it would favor transfer prices at market prices. In contrast, the refining division would prefer transfer prices at 105% of full cost to maximize its own division operating income. The hybrid transfer price of \$82 is between the 105% of full cost and market-based transfer prices. It splits the \$1,200 of operating income equally between the divisions, and could arise as a result of negotiations between the transportation and refining division managers.

It's not surprising that subunit managers, especially those whose compensation or promotion directly depends on subunit operating income, take considerable interest in setting transfer prices. To reduce the excessive focus of subunit managers on their own subunits, many companies compensate subunit managers on the basis of both subunit and company-wide operating incomes.

We next examine market-based, cost-based, and hybrid transfer prices in more detail. We show how the choice of transfer-pricing method combined with managers' sourcing decisions can determine the size of the company-wide operating-income pie itself.

Decision Point

What are alternative ways of calculating transfer prices, and what criteria should be used to evaluate them?

Learning Objective 4

Illustrate how market-based transfer prices promote goal congruence in perfectly competitive markets

... division managers transacting internally are motivated to take the same actions as if they were transacting externally

Market-Based Transfer Prices

Transferring products or services at market prices generally leads to optimal decisions when three conditions are satisfied: (1) The market for the intermediate product is perfectly competitive, (2) interdependencies of subunits are minimal, and (3) there are no additional costs or benefits to the company as a whole from buying or selling in the external market instead of transacting internally.

Perfectly-Competitive-Market Case

A **perfectly competitive market** exists when there is a homogeneous product with buying prices equal to selling prices and no individual buyers or sellers can affect those prices by their own actions. By using market-based transfer prices in perfectly competitive markets, a company can (1) promote goal congruence, (2) motivate management effort, (3) evaluate subunit performance, and (4) preserve subunit autonomy.

Consider Horizon Petroleum again. Assume there is a perfectly competitive market for crude oil in the Houston area. As a result, the transportation division can sell and the refining division can buy as much crude oil as each wants at \$85 per barrel. Horizon would prefer its managers to buy or sell crude oil internally. Think about the decisions that Horizon's division managers would make if each had the autonomy to sell or buy crude oil externally. If the transfer price between Horizon's transportation and refining divisions is set below \$85, the manager of the transportation division will be motivated to sell all crude oil to external buyers in the Houston area at \$85 per barrel. If the transfer price is set above \$85, the manager of the refining division will be motivated to purchase all crude oil requirements from external suppliers. Only an \$85 transfer price will motivate the transportation division and the refining division to buy and sell internally. That's because neither division profits by buying or selling in the external market.

Suppose Horizon evaluates division managers on the basis of their individual division's operating income. The transportation division will sell, either internally or externally, as much crude oil as it can profitably transport, and the refining division will buy, either internally or externally, as much crude oil as it can profitably refine. An \$85-per-barrel transfer price achieves goal congruence—the actions that maximize each division's operating income are also the actions that maximize operating income of Horizon Petroleum as a whole. Furthermore, because the transfer price is not based on costs, it motivates each division manager to exert management effort to maximize his or her own division's operating income. Market prices also serve to evaluate the economic viability and profitability of each division individually. For example, Koch Industries, the second-largest private company in the United States, uses market-based pricing for all internal transfers. As their CFO, Steve Feilmeier, notes, "We believe that the alternative for any given asset should always be considered in order to best optimize the profitability of the asset. If you simply transfer price between two different divisions at cost, then you may be subsidizing your whole operation and not know it." Returning to our Horizon example, suppose that under market-based transfer prices, the refining division consistently shows small or negative profits. Then, Horizon may consider shutting down the refining division and simply transport and sell the oil to other refineries in the Houston area.

Distress Prices

When supply outstrips demand, market prices may drop well below their historical averages. If the drop in prices is expected to be temporary, these low market prices are sometimes called "distress prices." Deciding whether a current market price is a distress price is often difficult. Prior to the worldwide spike in commodity prices in the 2006–2008 period, the market prices of several mineral and agricultural commodities, including nickel, uranium, and wheat, stayed for many years at what people initially believed were temporary distress levels!

Which transfer price should be used for judging performance if distress prices prevail? Some companies use the distress prices themselves, but others use long-run average prices, or "normal" market prices. In the short run, the manager of the selling subunit should

supply the product or service at the distress price as long as it exceeds the *incremental costs* of supplying the product or service. If the distress price is used as the transfer price, the selling division will show a loss because the distress price will not exceed the *full cost* of the division. If the long-run average market price is used, forcing the manager to buy internally at a price above the current market price will hurt the buying division's short-run operating income. But the long-run average market price will provide a better measure of the long-run profitability and viability of the supplier division. Of course, if the price remains low in the long run, the company should use the low market price as the transfer price. If this price is lower than the variable and fixed costs that can be saved if manufacturing facilities are shut down, the production facilities of the selling subunit should be sold, and the buying subunit should purchase the product from an external supplier.

Imperfect Competition

If markets are not perfectly competitive, selling prices affect the quantity of product sold. If the selling division sells its product in the external market, the selling division manager would choose a price and quantity combination that would maximize the division's operating income. If the transfer price is set at this selling price, the buying division may find that acquiring the product is too costly and results in a loss. It may decide not to purchase the product. Yet, from the point of view of the company as a whole, it may well be that profits are maximized if the selling division transfers the product to the buying division for further processing and sale. For this reason, when the market for the intermediate good is imperfectly competitive, the transfer price must generally be set below the external market price (but above the selling division's variable cost) in order to induce efficient transfers.⁵

Cost-Based Transfer Prices

Cost-based transfer prices are helpful when market prices are unavailable, inappropriate, or too costly to obtain, such as when markets are not perfectly competitive, when the product is specialized, or when the internal product is different from the products available externally in terms of quality and customer service.

Full-Cost Bases

In practice, many companies use transfer prices based on full cost. To approximate market prices, cost-based transfer prices are sometimes set at full cost plus a margin. These transfer prices, however, can lead to suboptimal decisions. Suppose Horizon Petroleum makes internal transfers at 105% of full cost. Recall that the refining division purchases, on average, 20,000 barrels of crude oil per day from a local Houston supplier, who delivers the crude oil to the refinery at a price of \$85 per barrel. To reduce crude oil costs, the refining division has located an independent producer in Matamoros—Gulfmex Corporation—that is willing to sell 20,000 barrels of crude oil per day at \$79 per barrel, delivered to Horizon's pipeline in Matamoros. Given Horizon's organization structure, the transportation division would purchase the 20,000 barrels of crude oil in Matamoros from Gulfmex, transport it to Houston, and then sell it to the refining division. The pipeline has unused capacity and can ship the 20,000 barrels per day at its variable cost of \$1 per barrel without affecting the shipment of the 10,000 barrels of crude oil per day acquired under its existing long-term contract arrangement. Will Horizon Petroleum incur lower costs by

⁵ Consider a firm where division S produces the intermediate product. S has a capacity of 15 units and a variable cost per unit of \$2. The imperfect competition is reflected in a downward-sloping demand curve for the intermediate product—if S wants to sell Q units, it has to lower the market price to $P = 20 - Q$. The division's profit function is therefore given by $Q \times (20 - Q) - 2Q = 18Q - Q^2$. Simple calculus reveals that it is optimal for S to sell 9 units of the intermediate product at a price of \$11, thereby making a profit of \$81. Now, suppose that division B in the same firm can take the intermediate product, incur an additional variable cost of \$4 and sell it in the external market for \$12. Since S has surplus capacity (it only uses 9 of its 15 units of capacity), it is clearly in the firm's interest to have S make additional units and transfer them to B. The firm makes an incremental profit of $\$12 - \$2 - \$4 = \6 for each transferred unit. However, if the transfer price for the intermediate product were set equal to the market price of \$11, B would reject the transaction since it would lose money on it ($\$12 - \$11 - \$4 = -\3 per unit).

To resolve this conflict, the transfer price should be set at a suitable *discount* to the external price in order to induce the buying division to seek internal transfers. In our example, the selling price must be greater than S's variable cost of \$2, but less than B's contribution margin of \$8. That is, the transfer price has to be discounted relative to the market price (\$11) by a minimum of \$3. We explore the issue of feasible transfer pricing ranges further in the section on hybrid transfer prices.

Decision Point

Under what market conditions do market-based transfer prices promote goal congruence?

Learning Objective 5

Understand how to avoid making suboptimal decisions when transfer prices are based on full cost plus a markup

... in situations when buying divisions regard the fixed costs and the markup as variable costs

purchasing crude oil from Gulfmex in Matamoros or by purchasing crude oil from the Houston supplier? Will the refining division show lower crude oil purchasing costs by acquiring oil from Gulfmex or by acquiring oil from its current Houston supplier?

The following analysis shows that Horizon Petroleum's operating income would be maximized by purchasing oil from Gulfmex. The analysis compares the incremental costs in both divisions under the two alternatives. The analysis assumes the fixed costs of the transportation division will be the same regardless of the alternative chosen. That is, the transportation division cannot save any of its fixed costs if it does not transport Gulfmex's 20,000 barrels of crude oil per day.

- **Alternative 1:** Buy 20,000 barrels from the Houston supplier at \$85 per barrel. Total costs to Horizon Petroleum are 20,000 barrels \times \$85 per barrel = \$1,700,000.
- **Alternative 2:** Buy 20,000 barrels in Matamoros at \$79 per barrel and transport them to Houston at a variable cost of \$1 per barrel. Total costs to Horizon Petroleum are 20,000 barrels \times (\$79 + \$1) per barrel = \$1,600,000.

There is a reduction in total costs to Horizon Petroleum of \$100,000 (\$1,700,000 – \$1,600,000) by acquiring oil from Gulfmex.

Suppose the transportation division's transfer price to the refining division is 105% of full cost. The refining division will see its reported division costs increase if the crude oil is purchased from Gulfmex:

$$\begin{aligned} \text{Transfer price} &= 1.05 \times \left(\begin{array}{ccc} \text{Purchase price} & \text{Variable cost per unit} & \text{Fixed cost per unit} \\ \text{from} & \text{of Transportation} & \text{of Transportation} \\ \text{Gulfmex} & \text{Division} & \text{Division} \end{array} \right) \\ &= 1.05 \times (\$79 + \$1 + \$3) = 1.05 \times \$83 = \$87.15 \text{ per barrel} \end{aligned}$$

- **Alternative 1:** Buy 20,000 barrels from Houston supplier at \$85 per barrel. Total costs to refining division are 20,000 barrels \times \$85 per barrel = \$1,700,000.
- **Alternative 2:** Buy 20,000 barrels from the transportation division of Horizon Petroleum that were purchased from Gulfmex. Total costs to refining division are 20,000 barrels \times \$87.15 per barrel = \$1,743,000.

As a profit center, the refining division can maximize its short-run division operating income by purchasing from the Houston supplier at \$1,700,000.

The refining division looks at each barrel that it obtains from the transportation division as a variable cost of \$87.15 per barrel; if 10 barrels are transferred, it costs the refining division \$871.50; if 100 barrels are transferred, it costs \$8,715. In fact, the variable cost per barrel is \$80 (\$79 to purchase the oil from Gulfmex plus \$1 to transport it to Houston). The remaining \$7.15 (\$87.15 – \$80) per barrel is the transportation division's fixed cost and markup. *The full cost plus a markup transfer-pricing method causes the refining division to regard the fixed cost (and the 5% markup) of the transportation division as a variable cost and leads to goal incongruence.*

Should Horizon's top management interfere and force the refining division to buy from the transportation division? Top management interference would undercut the philosophy of decentralization, so Horizon's top management would probably view the decision by the refining division to purchase crude oil from external suppliers as an inevitable cost of decentralization and not interfere. Of course, some interference may occasionally be necessary to prevent costly blunders. But recurring interference and constraints would simply transform Horizon from a decentralized company into a centralized company.

What transfer price will promote goal congruence for both the transportation and refining divisions? The minimum transfer price is \$80 per barrel. A transfer price below \$80 does not provide the transportation division with an incentive to purchase crude oil from Gulfmex in Matamoros because it is below the transportation division's incremental costs. The maximum transfer price is \$85 per barrel. A transfer price above \$85 will cause the refining division to purchase crude oil from the external market rather than from the transportation division. A transfer price between the minimum and maximum transfer prices of \$80 and \$85 will promote goal congruence: Each division will increase its own

reported operating income while increasing Horizon Petroleum's operating income if the refining division purchases crude oil from Gulfmex in Matamoros.

In the absence of a market-based transfer price, senior management at Horizon Petroleum cannot easily determine the profitability of the investment made in the transportation division and hence whether Horizon should keep or sell the pipeline. Furthermore, if the transfer price had been based on the actual costs of the transportation division, it would provide the division with no incentive to control costs. That's because all cost inefficiencies of the transportation division would get passed along as part of the actual full-cost transfer price. In fact, every additional dollar of cost arising from wastefulness in the transportation division would generate an additional five cents in profit for the division under the "105% of full cost" rule!

Surveys indicate that, despite the limitations, managers generally prefer to use full-cost-based transfer prices. That's because these transfer prices represent relevant costs for long-run decisions, they facilitate external pricing based on variable and fixed costs, and they are the least costly to administer. However, full-cost transfer pricing does raise many issues. How are each subunit's indirect costs allocated to products? Have the correct activities, cost pools, and cost-allocation bases been identified? Should the chosen fixed-cost rates be actual or budgeted? The issues here are similar to the issues that arise in allocating fixed costs, which were introduced in Chapter 14. Many companies determine the transfer price based on budgeted rates and practical capacity because it overcomes the problem of inefficiencies in actual costs and costs of unused capacity getting passed along to the buying division.

Variable-Cost Bases

Transferring 20,000 barrels of crude oil from the transportation division to the refining division at the variable cost of \$80 per barrel achieves goal congruence, as shown in the preceding section. The refining division would buy from the transportation division because the transportation division's variable cost is less than the \$85 price charged by external suppliers. Setting the transfer price equal to the variable cost has other benefits. Knowledge of the variable cost per barrel of crude oil is very helpful to the refining division for many decisions such as the short-run pricing decisions discussed in Chapters 11 and 12. However, at the \$80-per-barrel transfer price, the transportation division would record an operating loss, and the refining division would show large profits because it would be charged only for the variable costs of the transportation division. One approach to addressing this problem is to have the refining division make a lump-sum transfer payment to cover fixed costs and generate some operating income for the transportation division while the transportation division continues to make transfers at variable cost. The fixed payment is the price the refining division pays for using the capacity of the transportation division. The income earned by each division can then be used to evaluate the performance of each division and its manager.

Hybrid Transfer Prices

Consider again Horizon Petroleum. As we saw earlier, the transportation division has unused capacity it can use to transport oil from Matamoros to Houston at an incremental cost of \$80 per barrel of crude oil. Horizon Petroleum, as a whole, maximizes operating income if the refining division purchases crude oil from the transportation division rather than from the Houston market (incremental cost per barrel of \$80 versus price per barrel of \$85). Both divisions would be interested in transacting with each other (and the firm achieves goal congruence) if the transfer price is between \$80 and \$85.

For any internal transaction, there is generally a minimum transfer price the selling division will not go below, based on its cost structure. In the Horizon Petroleum example, the minimum price acceptable to the transportation division is \$80. There is also a maximum price the buying division will not wish to exceed, given by the lower of two quantities—the eventual contribution it generates from an internal transaction and the price of purchasing a comparable intermediate product from an outside party. For the

◀ **Decision Point**

What problems can arise when full cost plus a markup is used as the transfer price?

6

Learning Objective

Describe the range of feasible transfer prices when there is unused capacity

... from variable cost to market price of the product transferred

refining division, each barrel of gasoline sold to external parties generates \$182 in contribution (the \$190 price less the \$8 variable cost of refining). Since it takes two barrels of crude oil to generate a barrel of gasoline, this is equivalent to a contribution of \$91 per barrel of crude. For any price higher than \$91, the refining division would lose money for each barrel of crude it takes from the transportation division. On the other hand, the refining division can purchase crude oil on the open market for \$85 rather than having it transported internally. The maximum feasible transfer price is thus the lower of \$91 and \$85, or \$85 in this instance. We saw previously that a transfer price between the minimum price (\$80) and the maximum (\$85) would promote goal congruence. We now describe three different ways in which firms attempt to determine the specific transfer price within these bounds.

Prorating the Difference Between Maximum and Minimum Transfer Prices

One approach that Horizon Petroleum could pursue is to choose a transfer price that splits, on some fair basis, the \$5 difference between the \$85-per-barrel market-based maximum price the refining division is willing to pay and the \$80-per-barrel variable cost-based minimum price the transportation division wants to receive. An easy solution is to split the difference equally, resulting in a transfer price of \$82.50. However, this solution ignores the relative costs incurred by the two divisions and might lead to disparate profit margins on the work contributed by each division to the final product. As an alternative approach, Horizon Petroleum could allocate the \$5 difference on the basis of the variable costs of the two divisions. Using the data in Exhibit 22-1 (p. 782), variable costs are as follows:

Transportation division's variable costs to transport 100 barrels of crude oil ($\$1 \times 100$)	\$100
Refining division's variable costs to refine 100 barrels of crude oil and produce 50 barrels of gasoline ($\$8 \times 50$)	<u>400</u>
Total variable costs	<u>\$500</u>

Of the \$5 difference, the transportation division gets to keep $(\$100 \div \$500) \times \$5.00 = \1.00 , and the refining division gets to keep $(\$400 \div \$500) \times \$5.00 = \4.00 . That is, the transfer price is \$81 per barrel of crude oil (\$79 purchase cost + \$1 variable cost + \$1 that the transportation division gets to keep). In effect, this approach results in a budgeted variable-cost-plus transfer price. The “plus” indicates the setting of a transfer price above variable cost.

To decide on the \$1 and \$4 allocations of the \$5 incremental benefit to total company operating income per barrel, the divisions must share information about their variable costs. In effect, each division does not operate (at least for this transaction) in a totally decentralized manner. Furthermore, each division has an incentive to overstate its variable costs to receive a more-favorable transfer price. In the preceding example, suppose the transportation division claims a cost of \$2 per barrel to ship crude oil from Gulfmex to Houston. This increased cost raises the variable cost-based minimum price to $\$79 + \$2 = \$81$ per barrel; the maximum price remains \$85. Of the \$4 difference between the minimum and maximum, the transportation division now gets to keep $(\$200 \div (\$200 + \$400)) \times \$4.00 = \$1.33$, resulting in a higher transfer price of \$82.33. The refining division similarly benefits from asserting that its variable cost to refine 100 barrels of crude oil is greater than \$400. As a consequence, proration methods either require a high degree of trust and information exchange among divisions or include provisions for objective audits of cost information in order to be successful.

Negotiated Pricing

This is the most common hybrid method. Under this approach, top management does not administer a specific split of the eventual profits across the transacting divisions. Rather, the eventual transfer price results from a bargaining process between the selling and buying subunits. In the Horizon Petroleum case, for example, the transportation division and the refining division would be free to negotiate a price that is mutually acceptable to both.

As described earlier, the minimum and maximum feasible transfer prices are \$80 and \$85, respectively, per barrel of crude oil. Where between \$80 and \$85 will the transfer price

per barrel be set? Under a negotiated transfer price, the answer depends on several things: the bargaining strengths of the two divisions; information the transportation division has about the price minus incremental marketing costs of supplying crude oil to outside refineries; and the information the refining division has about its other available sources of crude oil. Negotiations become particularly sensitive because Horizon Petroleum can now evaluate each division's performance on the basis of division operating income. The price negotiated by the two divisions will, in general, have no specific relationship to either costs or market price. But cost and price information is often the starting point in the negotiation process.

Consider the following situation: Suppose the refining division receives an order to supply specially processed gasoline. The incremental cost to purchase and supply crude oil is still \$80 per barrel. However, suppose the refining division will profit from this order only if the transportation division can supply crude oil at a price not exceeding \$82 per barrel.⁶ In this case, the transfer price that would benefit both divisions must be greater than \$80 but less than \$82. Negotiations would allow the two divisions to achieve an acceptable transfer price. By contrast, a rule-based transfer price, such as a market-based price of \$85 or a 105% of full-cost-based price of \$87.15, would result in Horizon passing up a profitable opportunity.

A negotiated transfer price strongly preserves division autonomy. It also has the advantage that each division manager is motivated to put forth effort to increase division operating income. Surveys have found that approximately 15%–20% of firms set transfer prices based on negotiation among divisions. The key reason cited by firms that do not use negotiated prices is the cost of the bargaining process, that is, the time and energy spent by managers haggling over transfer prices.

Dual Pricing

There is seldom a single transfer price that simultaneously meets the criteria of promoting goal congruence, motivating management effort, evaluating subunit performance, and preserving subunit autonomy. As a result, some companies choose **dual pricing**, using two separate transfer-pricing methods to price each transfer from one subunit to another. An example of dual pricing arises when the selling division receives a full-cost-based price and the buying division pays the market price for the internally transferred products. Assume Horizon Petroleum purchases crude oil from Gulfmex in Matamoros at \$79 per barrel. One way of recording the journal entry for the transfer between the transportation division and the refining division is as follows:

1. Debit the refining division (the buying division) with the market-based transfer price of \$85 per barrel of crude oil.
2. Credit the transportation division (the selling division) with the 105%-of-full-cost transfer price of \$87.15 per barrel of crude oil.
3. Debit a corporate cost account for the \$2.15 ($\$87.15 - \85) per barrel difference between the two transfer prices.

The dual-pricing system promotes goal congruence because it makes the refining division no worse off if it purchases the crude oil from the transportation division rather than from the external supplier at \$85 per barrel. The transportation division receives a corporate subsidy. In dual pricing, the operating income for Horizon Petroleum as a whole is less than the sum of the operating incomes of the divisions.

Dual pricing is not widely used in practice even though it reduces the goal incongruence associated with a pure cost-based transfer-pricing method. One concern with dual pricing is that it leads to problems in computing the taxable income of subunits located in different tax jurisdictions, such as in our example, where the transportation division is taxed in Mexico while the refining division is taxed in the United States. A second concern is that dual pricing insulates managers from the frictions of the marketplace because costs, not market prices, affect the revenues of the supplying division.

⁶ For example, suppose a barrel of specially processed gasoline could be sold for \$200 but also required a higher variable cost of refining of \$36 per barrel. In this setting, the incremental contribution to the refining division is \$164 per barrel of gasoline, which implies that it will pay at most \$82 for a barrel of crude oil (since two barrels of crude are required for one barrel of gasoline).

◀ **Decision Point**

Within a range of feasible transfer prices, what are alternative ways for firms to arrive at the eventual price?

Learning Objective 7

Apply a general guideline for determining a minimum transfer price

... incremental cost plus opportunity cost of supplying division

A General Guideline for Transfer-Pricing Situations

Exhibit 22-3 summarizes the properties of market-based, cost-based, and negotiated transfer-pricing methods using the criteria described in this chapter. As the exhibit indicates, it is difficult for a transfer-pricing method to meet all criteria. Market conditions, the goal of the transfer-pricing system, and the criteria of promoting goal congruence, motivating management effort, evaluating subunit performance, and preserving subunit autonomy (if desired) must all be considered simultaneously. The transfer price a company will eventually choose depends on the economic circumstances and the decision at hand. Surveys of company practice indicate that the full-cost-based transfer price is generally the most frequently used transfer-pricing method around the world, followed by market-based transfer price and negotiated transfer price.

Our discussion thus far highlights that, barring settings in which a perfectly competitive market exists for the intermediate product, there is generally a range of possible transfer prices that would induce goal congruence. We now provide a general guideline for determining the minimum price in that range. The following formula is a helpful first step in setting the minimum transfer price in many situations:

$$\text{Minimum transfer price} = \begin{array}{c} \text{Incremental cost} \\ \text{per unit} \\ \text{incurred up} \\ \text{to the point of transfer} \end{array} + \begin{array}{c} \text{Opportunity cost} \\ \text{per unit} \\ \text{to the selling subunit} \end{array}$$

Incremental cost in this context means the additional cost of producing and transferring the product or service. Opportunity cost here is the maximum contribution margin forgone by the selling subunit if the product or service is transferred internally. For example, if the selling subunit is operating at capacity, the opportunity cost of transferring a unit internally rather than selling it externally is equal to the market price minus variable cost. That's because by transferring a unit internally, the subunit forgoes the contribution margin it could have obtained by selling the unit in the external market. We distinguish incremental cost from opportunity cost because financial accounting systems record incremental cost but do not record opportunity cost. The guideline measures a *minimum* transfer price because it represents the selling unit's cost of transferring the product. We illustrate the general guideline in some specific situations using data from Horizon Petroleum.

1. A perfectly competitive market for the intermediate product exists, and the selling division has no unused capacity. If the market for crude oil in Houston is perfectly

Exhibit 22-3

Comparison of Different Transfer-Pricing Methods

Criteria	Market-Based	Cost-Based	Negotiated
Achieves goal congruence	Yes, when markets are competitive	Often, but not always	Yes
Motivates management effort	Yes	Yes, when based on budgeted costs; less incentive to control costs if transfers are based on actual costs	Yes
Useful for evaluating subunit performance	Yes, when markets are competitive	Difficult unless transfer price exceeds full cost and even then is somewhat arbitrary	Yes, but transfer prices are affected by bargaining strengths of the buying and selling divisions
Preserves subunit autonomy	Yes, when markets are competitive	No, because it is rule-based	Yes, because it is based on negotiations between subunits
Other factors	Market may not exist, or markets may be imperfect or in distress	Useful for determining full cost of products and services; easy to implement	Bargaining and negotiations take time and may need to be reviewed repeatedly as conditions change

competitive, the transportation division can sell all the crude oil it transports to the external market at \$85 per barrel, and it will have no unused capacity. The transportation division's incremental cost (as shown in Exhibit 22-1, p. 782) is \$73 per barrel (purchase cost of \$72 per barrel plus variable transportation cost of \$1 per barrel) for oil purchased under the long-term contract or \$80 per barrel (purchase cost of \$79 plus variable transportation cost of \$1) for oil purchased at current market prices from Gulfmex. The transportation division's opportunity cost per barrel of transferring the oil internally is the contribution margin per barrel forgone by not selling the crude oil in the external market: \$12 for oil purchased under the long-term contract (market price, \$85, minus variable cost, \$73) and \$5 for oil purchased from Gulfmex (market price, \$85, minus variable cost, \$80). In either case,

$$\begin{aligned} \text{Minimum transfer price} &= \text{Incremental cost} + \text{Opportunity cost} \\ \text{per barrel} &= \text{per barrel} + \text{per barrel} \\ &= \$73 + \$12 = \$85 \\ &\text{or} \\ &= \$80 + \$5 = \$85 \end{aligned}$$

2. **An intermediate market exists that is not perfectly competitive, and the selling division has unused capacity.** In markets that are not perfectly competitive, capacity utilization can only be increased by decreasing prices. Unused capacity exists because decreasing prices is often not worthwhile—it decreases operating income.

If the transportation division has unused capacity, its opportunity cost of transferring the oil internally is zero because the division does not forgo any external sales or contribution margin from internal transfers. In this case,

$$\begin{aligned} \text{Minimum transfer price} &= \text{Incremental cost} \\ \text{per barrel} &= \text{per barrel} \end{aligned} \quad \begin{aligned} &\$73 \text{ per barrel for oil purchased under the} \\ &\text{long-term contract or } \$80 \text{ per barrel for} \\ &\text{oil purchased from Gulfmex in Matamoros} \end{aligned}$$

In general, when markets are not perfectly competitive, the potential to influence demand and operating income through prices complicates the measurement of opportunity costs. The transfer price depends on constantly changing levels of supply and demand. There is not just one transfer price. Rather, the transfer prices for various quantities supplied and demanded depend on the incremental costs and opportunity costs of the units transferred.

3. **No market exists for the intermediate product.** This situation would occur for the Horizon Petroleum case if the crude oil transported by the transportation division could be used only by the Houston refinery (due to, say, its high tar content) and would not be wanted by external parties. Here, the opportunity cost of supplying crude oil internally is zero because the inability to sell crude oil externally means no contribution margin is forgone. For the transportation division of Horizon Petroleum, the minimum transfer price under the general guideline is the incremental cost per barrel (either \$73 or \$80). As in the previous case, any transfer price between the incremental cost and \$85 will achieve goal congruence.

Multinational Transfer Pricing and Tax Considerations

Transfer pricing is an important accounting priority for managers around the world. A 2007 Ernst & Young survey of multinational enterprises in 24 countries found that 74% of parent firms and 81% of subsidiary respondents believed that transfer pricing was “absolutely critical” or “very important” to their organizations. The reason is that parent companies identify transfer pricing as the single most important tax issue they face. The sums of money involved are often staggering. Google, for example, has a 90% market share of UK internet searches and earned £1.6 billion in advertising revenues last year in Britain; yet, Google UK reported a pretax loss of £26 million. The reason is that revenues from customers in Britain are transferred to Google's European headquarters in Dublin. By paying the low Irish corporate tax rate of 12.5%, Google saved £450 million in UK taxes in 2009 alone. Transfer prices affect not just income taxes, but

Decision Point

What is the general guideline for determining a minimum transfer price?

Learning Objective 8

Incorporate income tax considerations in multinational transfer pricing

... set transfer prices to minimize tax payments to the extent permitted by tax authorities

also payroll taxes, customs duties, tariffs, sales taxes, value-added taxes, environment-related taxes, and other government levies. Our aim here is to highlight tax factors, and in particular income taxes, as important considerations in determining transfer prices.

Transfer Pricing for Tax Minimization

Consider the Horizon Petroleum data in Exhibit 22-2 (p. 783). Assume that the transportation division based in Mexico pays Mexican income taxes at 30% of operating income and that the refining division based in the United States pays income taxes at 20% of operating income. Horizon Petroleum would minimize its total income tax payments with the 105%-of-full-cost transfer-pricing method, as shown in the following table, because this method minimizes income reported in Mexico, where income is taxed at a higher rate than in the United States.

Transfer-Pricing Method	Operating Income for 100 Barrels of Crude Oil			Income Tax on 100 Barrels of Crude Oil		
	Transportation Division (Mexico) (1)	Refining Division (United States) (2)	Total (3) = (1) + (2)	Transportation Division (Mexico) (4) = 0.30 × (1)	Refining Division (United States) (5) = 0.20 × (2)	Total (6) = (4) + (5)
Market price	\$900	\$300	\$1,200	\$270	\$ 60	\$330
105% of full costs	380	820	1,200	114	164	278
Hybrid price	600	600	1,200	180	120	300

Income tax considerations raise additional issues. Tax issues may conflict with other objectives of transfer pricing. Suppose the market for crude oil in Houston is perfectly competitive. In this case, the market-based transfer price achieves goal congruence, provides incentives for management effort, and helps Horizon to evaluate the economic profitability of the transportation division. But it is costly from the perspective of income taxes. To minimize income taxes, Horizon would favor using 105% of full cost for tax reporting. Tax laws in the United States and Mexico, however, constrain this option. In particular, the Mexican tax authorities, aware of Horizon's incentives to minimize income taxes by reducing the income reported in Mexico, would challenge any attempts to shift income to the refining division through an unreasonably low transfer price (see also Concepts in Action, p. 793).

Section 482 of the U.S. Internal Revenue Code governs taxation of multinational transfer pricing. Section 482 requires that transfer prices between a company and its foreign division or subsidiary, for both tangible and intangible property, equal the price that would be charged by an unrelated third party in a comparable transaction. Regulations related to Section 482 recognize that transfer prices can be market-based or cost-plus-based, where the plus represents margins on comparable transactions.⁷

If the market for crude oil in Houston is perfectly competitive, Horizon would be required to calculate taxes using the market price of \$85 for transfers from the transportation division to the refining division. Horizon might successfully argue that the transfer price should be set below the market price because the transportation division incurs no marketing and distribution costs when selling crude oil to the refining division. For example, if marketing and distribution costs equal \$2 per barrel, Horizon could set the transfer price at \$83 (\$85 – \$2) per barrel, the selling price net of marketing and distribution costs. Under the U.S. Internal Revenue Code, Horizon could obtain advanced approval of the transfer-pricing arrangements from the tax authorities, called an *advanced pricing agreement* (APA). The APA is a binding agreement for a specified number of years. The goal of the APA program is to avoid costly transfer-pricing disputes between taxpayers and tax authorities. In 2007, there were 81 APAs executed, of which 54 were bilateral agreements with other tax treaty countries. Included in this was the completion of the first bilateral APA between the United States and China, involving Wal-Mart Stores.

The current global recession has pushed governments around the world to impose tighter trading rules and more aggressively pursue tax revenues. The number of countries

⁷ J. Styron, "Transfer Pricing and Tax Planning: Opportunities for US Corporations Operating Abroad," *CPA Journal Online* (November 2007); R. Feinschreiber (Ed.), *Transfer Pricing Handbook*, 3rd ed. (New York: John Wiley & Sons, 2002).

Concepts in Action

Transfer Pricing Dispute Temporarily Stops the Flow of Fiji Water



Tax authorities and government officials across the globe pay close attention to taxes paid by multinational companies operating within their boundaries. At the heart of the issue are the transfer prices that companies use to transfer products from one country to another. Since 2008, Fiji Water, LLC, a U.S.-based company that markets its famous brand of bottled water in more than a dozen countries, has been engaged in a fierce transfer-pricing dispute with the government of the Fiji Islands, where its water bottling plant is located.

While Fiji Water is produced in the Fiji Islands, all other activities in the company's value chain—importing, distributing, and retailing—occur in the countries where Fiji Water is sold. Over time, the Fiji Islands government became concerned that Fiji Water was engaging in transfer price manipulations, selling the water shipments produced in the Fiji Islands at a very low price to the company headquarters in Los Angeles. It was feared that very little of the wealth generated by Fiji Water, the country's second largest exporter, was coming into the Fiji Islands as foreign reserves from export earnings, which Fiji badly needed to fund its imports. To the Fiji Islands government, Fiji Water was funneling most of its cash to the United States.

As a result of these concerns, the Fiji Islands Revenue and Customs Authority (FIRCA) decided to take action against Fiji Water. FIRCA halted exports in January 2008 at ports in the Fiji Islands by putting 200 containers loaded with Fiji Water bottled under armed guard, and issuing a statement accusing Fiji Water of transfer price manipulations. FIRCA's chief executive, Jitoko Tikolevu, said, "The wholly U.S.-owned Fijian subsidiary sold its water exclusively to its U.S. parent at the declared rate, in Fiji, of \$4 a carton. In the U.S., though, the same company then sold it for up to \$50 a carton."

Fiji Water immediately filed a lawsuit against FIRCA with the High Court of Fiji. The court issued an interim order, allowing the company to resume shipment of the embargoed containers upon payment of a bond to the court. In the media and subsequent court filings, the company stated that on a global basis it sold each carton of water for \$20–28, and it did not make a profit due to "heavy investments in assets, employees, and marketing necessary to aggressively grow a successful branded product."

The dispute between FIRCA and Fiji Water remains unresolved in the Fiji Islands court system. In the interim, Fiji Water has maintained its previous transfer price of \$4 for water produced at its bottling plant in the Fiji Islands. To pressure the company to change its transfer pricing practices, the Fiji Islands government considered adding a 20-cents-per-litre excise tax on water produced in the country, but the tax was ultimately rejected as too draconian. As this high-profile case demonstrates, transfer pricing formulas and taxation details remain a contentious issue for governments and countries around the globe.

Source: Matau, Robert. 2008. Fiji water explains saga. *Fiji Times*, February 9; McMaster, James and Jan Novak. 2009. Fiji water and corporate social responsibility—Green makeover or 'green-washing'? The University of Western Ontario Richard Ivey School of Business No. 909A08, London, Ontario: Ivey Publishing.

that have imposed transfer pricing regulations has approximately quadrupled from 1995 to 2007, according to a 2008 KPMG report. Officials in China, where foreign businesses enjoyed favorable treatment until last year, recently issued new rules requiring multinationals to submit extensive transfer-pricing documentation. Countries such as India, Canada, Turkey, and Greece have brought greater scrutiny to bear on transfer pricing, focusing in particular on intellectual-property values, costs of back-office functions and losses of any type. In the United States, the Obama administration plans to shrink a "tax gap" the IRS estimates may be as high as \$345 billion by restricting or closing several widely used tax loopholes. While the plan does not directly address transfer pricing practice, the IRS has become even more aggressive with enforcement. The agency added 1,200 people to its international staff in 2009, and the 2010 budget called for hiring another 800.

Transfer Prices Designed for Multiple Objectives

To meet multiple transfer-pricing objectives, such as minimizing income taxes, achieving goal congruence, and motivating management effort, a company may choose to keep one set of accounting records for tax reporting and a second set for internal management reporting.

Of course, it is costly to maintain two sets of books and companies such as Case New Holland, a world leader in the agricultural and construction equipment business, also oppose it for conceptual reasons. However, a survey by the AnswerThink Consulting Group of large companies (more than \$2 billion in revenues) found that 77% used separate reporting systems to track internal pricing information, compared with about 25% of large companies outside that “best practices” group. Microsoft, for example, believes in “delinking” transfer pricing and employs an internal measurement system (Microsoft Accounting Principles, or MAPs) that uses a separate set of company-designed rules and accounts.⁸ A key aspect of management control at Microsoft is the desire to hold local managers accountable for product profitability and to establish appropriate sales and marketing spending levels for every product line. To establish these sales and spending levels, the firm creates a profitability statement for every product in every region, and allocates G&A and R&D costs across sales divisions in ways that aren’t necessarily the most tax efficient.

Even if a company does not have such formal separated reporting systems, it can still informally adjust transfer prices to satisfy the tradeoff between tax minimization and incentive provision. Consider a multinational firm that makes semiconductor products that it sells through its sales organization in a higher-tax country. To minimize taxes, the parent sets a high transfer price, thereby lowering the operating income of the foreign sales organization. It would be inappropriate to penalize the country sales manager for this low income since the sales organization has no say in determining the transfer price. As an alternative, the company can evaluate the sales manager on the direct contribution (revenues minus marketing costs) incurred in the country. That is, the transfer price incurred to acquire the semiconductor products is omitted for performance-evaluation purposes. Of course, this is not a perfect solution. By ignoring the cost of acquiring the products, the sales manager is given incentives to overspend on local marketing relative to what would be optimal from the firm’s overall perspective. If the dysfunctional effects of this are suitably large, corporate managers must then step in and dictate specific operational decisions and goals for the manager based on the information available to them. More generally, adoption of a tax-compliant transfer pricing policy creates a need for nonfinancial performance indicators at lower management levels in order to better evaluate and reward performance.⁹

Additional Issues in Transfer Pricing

Additional factors that arise in multinational transfer pricing include tariffs and customs duties levied on imports of products into a country. The issues here are similar to income tax considerations; companies will have incentives to lower transfer prices for products imported into a country to reduce tariffs and customs duties charged on those products.

In addition to the motivations for choosing transfer prices already described, multinational transfer prices are sometimes influenced by restrictions that some countries place on dividend- or income-related payments to parties outside their national borders. By increasing the prices of goods or services transferred into divisions in these countries, companies can seek to increase the cash paid out of these countries without violating dividend- or income-related restrictions.

Decision Point

How do income tax considerations affect transfer pricing in multinationals?

Problem for Self-Study

The Pillercat Corporation is a highly decentralized company. Each division manager has full authority for sourcing decisions and selling decisions. The machining division of Pillercat has been the major supplier of the 2,000 crankshafts that the tractor division needs each year.

The tractor division, however, has just announced that it plans to purchase all its crankshafts in the forthcoming year from two external suppliers at \$200 per crankshaft.

⁸ For further details, see I. Springsteel, “Separate but Unequal,” *CFO Magazine*, August 1999.

⁹ Cools et al. “Management control in the transfer pricing tax compliant multinational enterprise,” *Accounting, Organizations and Society*, August 2008 provides an illustrative case study of this issue in the context of a semiconductor product division of a multinational firm.

The machining division of Pillercat recently increased its selling price for the forthcoming year to \$220 per unit (from \$200 per unit in the current year).

Juan Gomez, manager of the machining division, feels that the 10% price increase is justified. It results from a higher depreciation charge on some new specialized equipment used to manufacture crankshafts and an increase in labor costs. Gomez wants the president of Pillercat Corporation to force the tractor division to buy all its crankshafts from the machining division at the price of \$220. The following table summarizes the key data.

		Home	Insert	Page Layout	Formulas	Data	Review
	A	B					
1	Number of crankshafts purchased by tractor division	2,000					
2	External supplier's market price per crankshaft	\$ 200					
3	Variable cost per crankshaft in machining division	\$ 190					
4	Fixed cost per crankshaft in machining division	\$ 20					

1. Compute the advantage or disadvantage in terms of annual operating income to the Pillercat Corporation as a whole if the tractor division buys crankshafts internally from the machining division under each of the following cases:
 - a. The machining division has no alternative use for the facilities used to manufacture crankshafts.
 - b. The machining division can use the facilities for other production operations, which will result in annual cash operating savings of \$29,000.
 - c. The machining division has no alternative use for its facilities, and the external supplier drops the price to \$185 per crankshaft.
2. As the president of Pillercat, how would you respond to Juan Gomez's request that you force the tractor division to purchase all of its crankshafts from the machining division? Would your response differ according to the three cases described in requirement 1? Explain.

Required

Solution

1. Computations for the tractor division buying crankshafts internally for one year under cases a, b, and c are as follows:

		Home	Insert	Page Layout	Formulas	Data	Review	View
	A	B	C	D				
1			Case					
2		a	b	c				
3	Number of crankshafts purchased by tractor division	2,000	2,000	2,000				
4	External supplier's market price per crankshaft	\$ 200	\$ 200	\$ 185				
5	Variable cost per crankshaft in machining division	\$ 190	\$ 190	\$ 190				
6	Opportunity costs of the machining division supplying crankshafts to the tractor division	-	\$ 29,000	-				
7								
8	Total purchase costs if buying from an external supplier							
9	(2,000 shafts × \$200, \$200, \$185 per shaft)	\$400,000	\$400,000	\$370,000				
10	Incremental cost of buying from the machining division							
11	(2,000 shafts × \$190 per shaft)	380,000	380,000	380,000				
12	Total opportunity costs of the machining division	-	29,000	-				
13	Total relevant costs	380,000	409,000	380,000				
14	Annual operating income advantage (disadvantage) to							
15	Pillercat of buying from the machining division	\$ 20,000	\$ (9,000)	\$ (10,000)				

The general guideline that was introduced in the chapter (p. 790) as a first step in setting a transfer price can be used to highlight the alternatives:

	A	B	C	D	E	F	G
		Incremental Cost per Unit Incurred to Point of Transfer	+	Opportunity Cost per Unit to the Supplying Division	=	Transfer Price	External Market Price
1	Case						
2	a	\$190	+	\$0	=	\$190.00	\$200
3	b	\$190	+	\$14.50 ^a	=	\$204.50	\$200
4	c	\$190	+	\$0	=	\$190.00	\$185
5							
6	^a Opportunity cost per unit = Total opportunity costs ÷ Number of crankshafts = \$29,000 ÷ 2,000 = \$14.50						
7							

Comparing transfer price to external-market price, the tractor division will maximize annual operating income of Pillercat Corporation as a whole by purchasing from the machining division in case a and by purchasing from the external supplier in cases b and c.

- Pillercat Corporation is a highly decentralized company. If no forced transfer were made, the tractor division would use an external supplier, a decision that would be in the best interest of the company as a whole in cases b and c of requirement 1 but not in case a.

Suppose in case a, the machining division refuses to meet the price of \$200. This decision means that the company will be \$20,000 worse off in the short run. Should top management interfere and force a transfer at \$200? This interference would undercut the philosophy of decentralization. Many top managers would not interfere because they would view the \$20,000 as an inevitable cost of a suboptimal decision that can occur under decentralization. But how high must this cost be before the temptation to interfere would be irresistible? \$30,000? \$40,000?

Any top management interference with lower-level decision making weakens decentralization. Of course, Pillercat's management may occasionally interfere to prevent costly mistakes. But recurring interference and constraints would hurt Pillercat's attempts to operate as a decentralized company.

Decision Points

The following question-and-answer format summarizes the chapter's learning objectives. Each decision presents a key question related to a learning objective. The guidelines are the answer to that question.

Decision

- What is a management control system and how should it be designed?

Guidelines

A management control system is a means of gathering and using information to aid and coordinate the planning and control decisions throughout the organization and to guide the behavior of managers and other employees. Effective management control systems (a) are closely aligned to the organization's strategy, (b) support the organizational responsibilities of individual managers, and (c) motivate managers and other employees to give effort to achieve the organization's goals.

2. What are the benefits and costs of decentralization?
 The benefits of decentralization include (a) greater responsiveness to local needs, (b) gains from faster decision making, (c) increased motivation of subunit managers, (d) greater management development and learning, and (e) sharpened focus of subunit managers. The costs of decentralization include (a) suboptimal decision making, (b) excessive focus on the subunit rather than the company as a whole, (c) increased costs of information gathering, and (d) duplication of activities.
3. What are alternative ways of calculating transfer prices, and what criteria should be used to evaluate them?
 A transfer price is the price one subunit charges for a product or service supplied to another subunit of the same organization. Transfer prices can be (a) market-based, (b) cost-based, or (c) hybrid. Different transfer-pricing methods produce different revenues and costs for individual subunits, and hence, different operating incomes for the subunits. Transfer prices seek to (a) promote goal congruence, (b) motivate management effort, (c) help evaluate subunit performance, and (d) preserve subunit autonomy (if desired).
4. Under what market conditions do market-based transfer prices promote goal congruence?
 In perfectly competitive markets, there is no unused capacity, and division managers can buy and sell as much of a product or service as they want at the market price. In such settings, using the market price as the transfer price motivates division managers to transact internally and to take exactly the same actions as they would if they were transacting in the external market.
5. What problems can arise when full cost plus a markup is used as the transfer price?
 A transfer price based on full cost plus a markup may lead to suboptimal decisions because it leads the buying division to regard the fixed costs and the markup of the selling division as a variable cost. The buying division may then purchase products from an external supplier expecting savings in costs that, in fact, will not occur.
6. Within a range of feasible transfer prices, what are alternative ways for firms to arrive at the eventual price?
 When there is unused capacity, the transfer-price range lies between the minimum price at which the selling division is willing to sell (its variable cost per unit) and the maximum price the buying division is willing to pay (the lower of its contribution or price at which the product is available from external suppliers). Methods for arriving at a price in this range include proration (such as splitting the difference equally or on the basis of relative variable costs), negotiation between divisions, and dual pricing.
7. What is the general guideline for determining a minimum transfer price?
 The general guideline states that the minimum transfer price equals the incremental cost per unit incurred up to the point of transfer plus the opportunity cost per unit to the selling division resulting from transferring products or services internally.
8. How do income tax considerations affect transfer pricing in multinationals?
 Transfer prices can reduce income tax payments by reporting more income in low-tax-rate countries and less income in high-tax-rate countries. However, tax regulations of different countries restrict the transfer prices that companies can use.

Terms to Learn

This chapter and the Glossary at the end of the book contain definitions of the following important terms:

autonomy (p. 777)

decentralization (p. 778)

dual pricing (p. 789)

dysfunctional decision making (p. 778)

effort (p. 776)

goal congruence (p. 776)

incongruent decision making (p. 778)

intermediate product (p. 780)

management control system (p. 775)

motivation (p. 776)

perfectly competitive market (p. 784)

suboptimal decision making (p. 778)

transfer price (p. 780)

Assignment Material

Questions

22-1 What is a management control system?

22-2 Describe three criteria you would use to evaluate whether a management control system is effective.

22-3 What is the relationship among motivation, goal congruence, and effort?

- 22-4** Name three benefits and two costs of decentralization.
- 22-5** “Organizations typically adopt a consistent decentralization or centralization philosophy across all their business functions.” Do you agree? Explain.
- 22-6** “Transfer pricing is confined to profit centers.” Do you agree? Explain.
- 22-7** What are the three methods for determining transfer prices?
- 22-8** What properties should transfer-pricing systems have?
- 22-9** “All transfer-pricing methods give the same division operating income.” Do you agree? Explain.
- 22-10** Under what conditions is a market-based transfer price optimal?
- 22-11** What is one potential limitation of full-cost-based transfer prices?
- 22-12** Give two reasons why the dual-pricing system of transfer pricing is not widely used.
- 22-13** “Cost and price information play no role in negotiated transfer prices.” Do you agree? Explain.
- 22-14** “Under the general guideline for transfer pricing, the minimum transfer price will vary depending on whether the supplying division has unused capacity or not.” Do you agree? Explain.
- 22-15** How should managers consider income tax issues when choosing a transfer-pricing method?



Exercises

22-16 Evaluating management control systems, balanced scorecard. Adventure Parks Inc. (API) operates ten theme parks throughout the United States. The company’s slogan is “Name Your Adventure,” and its mission is to offer an exciting theme park experience to visitors of all ages. API’s corporate strategy supports this mission by stressing the importance of sparkling clean surroundings, efficient crowd management and, above all, cheerful employees. Of course, improved shareholder value drives this strategy.

Required

- Assuming that API uses a balanced scorecard approach (see Chapter 13) to formulating its management control system. List three measures that API might use to evaluate each of the four balanced scorecard perspectives: financial perspective, customer perspective, internal-business-process perspective, and learning-and-growth perspective.
- How would the management controls related to financial and customer perspectives at API differ between the following three managers: a souvenir shop manager, a park general manager, and the corporation’s CEO?

22-17 Cost centers, profit centers, decentralization, transfer prices. Fenster Corporation manufactures windows with wood and metal frames. Fenster has three departments: glass, wood, and metal. The glass department makes the window glass and sends it to either the wood or metal department where the glass is framed. The window is then sold. Upper management sets the production schedules for the three departments and evaluates them on output quantity, cost variances, and product quality.

Required

- Are the three departments cost centers, revenue centers, or profit centers?
- Are the three departments centralized or decentralized?
- Can a centralized department be a profit center? Why or why not?
- Suppose the upper management of Fenster Corporation decides to let the three departments set their own production schedules, buy and sell products in the external market, and have the wood and metal departments negotiate with the glass department for the glass panes using a transfer price.
 - Will this change your answers to requirements 1 and 2?
 - How would you recommend upper management evaluate the three departments if this change is made?

22-18 Benefits and costs of decentralization. Jackson Markets, a chain of traditional supermarkets, is interested in gaining access to the organic and health food retail market by acquiring a regional company in that sector. Jackson intends to operate the newly-acquired stores independently from its supermarkets.

One of the prospects is Health Source, a chain of twenty stores in the mid-Atlantic. Buying for all twenty stores is done by the company’s central office. Store managers must follow strict guidelines for all aspects of store management in an attempt to maintain consistency among stores. Store managers are evaluated on the basis of achieving profit goals developed by the central office.

The other prospect is Harvest Moon, a chain of thirty stores in the Northeast. Harvest Moon managers are given significant flexibility in product offerings, allowing them to negotiate purchases with local organic farmers. Store managers are rewarded for exceeding self-developed return on investment goals with company stock options. Some managers have become significant shareholders in the company, and have even decided on their own to open additional store locations to improve market penetration. However, the increased autonomy has led to competition and price cutting among Harvest Moon stores within the same geographic market, resulting in lower margins.

Required

- Would you describe Health Source as having a centralized or a decentralized structure? Explain.
- Would you describe Harvest Moon as having a centralized or a decentralized structure? Discuss some of the benefits and costs of that type of structure.

3. Would stores in each chain be considered cost centers, revenue centers, profit centers, or investment centers? How does that tie into the evaluation of store managers?
4. Assume that Jackson chooses to acquire Harvest Moon. What steps can Jackson take to improve goal congruence between store managers and the larger company?

22-19 Multinational transfer pricing, effect of alternative transfer-pricing methods, global income tax minimization. Tech Friendly Computer, Inc., with headquarters in San Francisco, manufactures and sells a desktop computer. Tech Friendly has three divisions, each of which is located in a different country:

- a. China division—manufactures memory devices and keyboards
- b. South Korea division—assembles desktop computers using locally manufactured parts, along with memory devices and keyboards from the China division
- c. U.S. division—packages and distributes desktop computers

Each division is run as a profit center. The costs for the work done in each division for a single desktop computer are as follows:

China division: Variable cost = 900 yuan

Fixed cost = 1,980 yuan

South Korea division: Variable cost = 350,000 won

Fixed cost = 470,000 won

U.S. division: Variable cost = \$125

Fixed cost = \$325

- Chinese income tax rate on the China division's operating income: 40%
- South Korean income tax rate on the South Korea division's operating income: 20%
- U.S. income tax rate on the U.S. division's operating income: 30%

Each desktop computer is sold to retail outlets in the United States for \$3,800. Assume that the current foreign exchange rates are as follows:

9 yuan = \$1 U.S.

1,000 won = \$1 U.S.

Both the China and the South Korea divisions sell part of their production under a private label. The China division sells the comparable memory/keyboard package used in each Tech Friendly desktop computer to a Chinese manufacturer for 4,500 yuan. The South Korea division sells the comparable desktop computer to a South Korean distributor for 1,340,000 won.

1. Calculate the after-tax operating income per unit earned by each division under the following transfer-pricing methods: (a) market price, (b) 200% of full cost, and (c) 350% of variable cost. (Income taxes are not included in the computation of the cost-based transfer prices.)
2. Which transfer-pricing method(s) will maximize the after-tax operating income per unit of Tech Friendly Computer?

Required

22-20 Transfer-pricing methods, goal congruence. British Columbia Lumber has a raw lumber division and a finished lumber division. The variable costs are as follows:

- Raw lumber division: \$100 per 100 board-feet of raw lumber
- Finished lumber division: \$125 per 100 board-feet of finished lumber

Assume that there is no board-feet loss in processing raw lumber into finished lumber. Raw lumber can be sold at \$200 per 100 board-feet. Finished lumber can be sold at \$275 per 100 board-feet.

1. Should British Columbia Lumber process raw lumber into its finished form? Show your calculations.
2. Assume that internal transfers are made at 110% of variable cost. Will each division maximize its division operating-income contribution by adopting the action that is in the best interest of British Columbia Lumber as a whole? Explain.
3. Assume that internal transfers are made at market prices. Will each division maximize its division operating-income contribution by adopting the action that is in the best interest of British Columbia Lumber as a whole? Explain.

Required

22-21 Effect of alternative transfer-pricing methods on division operating income. (CMA, adapted) Ajax Corporation has two divisions. The mining division makes toldine, which is then transferred to the metals division. The toldine is further processed by the metals division and is sold to customers at a price of \$150 per unit. The mining division is currently required by Ajax to transfer its total yearly output of

200,000 units of toldine to the metals division at 110% of full manufacturing cost. Unlimited quantities of toldine can be purchased and sold on the outside market at \$90 per unit.

The following table gives the manufacturing cost per unit in the mining and metals divisions for 2012:

	Mining Division	Metals Division
Direct material cost	\$12	\$ 6
Direct manufacturing labor cost	16	20
Manufacturing overhead cost	<u>32^a</u>	<u>25^b</u>
Total manufacturing cost per unit	<u>\$60</u>	<u>\$51</u>

^aManufacturing overhead costs in the mining division are 25% fixed and 75% variable.

^bManufacturing overhead costs in the metals division are 60% fixed and 40% variable.

Required

1. Calculate the operating incomes for the mining and metals divisions for the 200,000 units of toldine transferred under the following transfer-pricing methods: (a) market price and (b) 110% of full manufacturing cost.
2. Suppose Ajax rewards each division manager with a bonus, calculated as 1% of division operating income (if positive). What is the amount of bonus that will be paid to each division manager under the transfer-pricing methods in requirement 1? Which transfer-pricing method will each division manager prefer to use?
3. What arguments would Brian Jones, manager of the mining division, make to support the transfer-pricing method that he prefers?

22-22 Transfer pricing, general guideline, goal congruence. (CMA, adapted). Quest Motors, Inc., operates as a decentralized multidivision company. The Vivo division of Quest Motors purchases most of its airbags from the airbag division. The airbag division's incremental cost for manufacturing the airbags is \$90 per unit. The airbag division is currently working at 80% of capacity. The current market price of the airbags is \$125 per unit.

Required

1. Using the general guideline presented in the chapter, what is the minimum price at which the airbag division would sell airbags to the Vivo division?
2. Suppose that Quest Motors requires that whenever divisions with unused capacity sell products internally, they must do so at the incremental cost. Evaluate this transfer-pricing policy using the criteria of goal congruence, evaluating division performance, motivating management effort, and preserving division autonomy.
3. If the two divisions were to negotiate a transfer price, what is the range of possible transfer prices? Evaluate this negotiated transfer-pricing policy using the criteria of goal congruence, evaluating division performance, motivating management effort, and preserving division autonomy.
4. Instead of allowing negotiation, suppose that Quest specifies a hybrid transfer price that "splits the difference" between the minimum and maximum prices from the divisions' standpoint. What would be the resulting transfer price for airbags?

22-23 Multinational transfer pricing, global tax minimization. The Mornay Company manufactures telecommunications equipment at its plant in Toledo, Ohio. The company has marketing divisions throughout the world. A Mornay marketing division in Vienna, Austria, imports 10,000 units of Product 4A36 from the United States. The following information is available:

U.S. income tax rate on the U.S. division's operating income	35%
Austrian income tax rate on the Austrian division's operating income	40%
Austrian import duty	15%
Variable manufacturing cost per unit of Product 4A36	\$ 550
Full manufacturing cost per unit of Product 4A36	\$ 800
Selling price (net of marketing and distribution costs) in Austria	\$1,150

Suppose the United States and Austrian tax authorities only allow transfer prices that are between the full manufacturing cost per unit of \$800 and a market price of \$950, based on comparable imports into Austria. The Austrian import duty is charged on the price at which the product is transferred into Austria. Any import duty paid to the Austrian authorities is a deductible expense for calculating Austrian income taxes due.

Required

1. Calculate the after-tax operating income earned by the United States and Austrian divisions from transferring 10,000 units of Product 4A36 (a) at full manufacturing cost per unit and (b) at market price of comparable imports. (Income taxes are not included in the computation of the cost-based transfer prices.)
2. Which transfer price should the Mornay Company select to minimize the total of company import duties and income taxes? Remember that the transfer price must be between the full manufacturing cost per unit of \$800 and the market price of \$950 of comparable imports into Austria. Explain your reasoning.

22-24 Multinational transfer pricing, goal congruence (continuation of 22-23). Suppose that the U.S. division could sell as many units of Product 4A36 as it makes at \$900 per unit in the U.S. market, net of all marketing and distribution costs.

1. From the viewpoint of the Mornay Company as a whole, would after-tax operating income be maximized if it sold the 10,000 units of Product 4A36 in the United States or in Austria? Show your computations.
2. Suppose division managers act autonomously to maximize their division's after-tax operating income. Will the transfer price calculated in requirement 2 of Exercise 22-23 result in the U.S. division manager taking the actions determined to be optimal in requirement 1 of this exercise? Explain.
3. What is the minimum transfer price that the U.S. division manager would agree to? Does this transfer price result in the Mornay Company as a whole paying more import duty and taxes than the answer to requirement 2 of Exercise 22-23? If so, by how much?

Required

22-25 Transfer-pricing dispute. The Allison-Chambers Corporation, manufacturer of tractors and other heavy farm equipment, is organized along decentralized product lines, with each manufacturing division operating as a separate profit center. Each division manager has been delegated full authority on all decisions involving the sale of that division's output both to outsiders and to other divisions of Allison-Chambers. Division C has in the past always purchased its requirement of a particular tractor-engine component from division A. However, when informed that division A is increasing its selling price to \$150, division C's manager decides to purchase the engine component from external suppliers.

Division C can purchase the component for \$135 per unit in the open market. Division A insists that, because of the recent installation of some highly specialized equipment and the resulting high depreciation charges, it will not be able to earn an adequate return on its investment unless it raises its price. Division A's manager appeals to top management of Allison-Chambers for support in the dispute with division C and supplies the following operating data:

C's annual purchases of the tractor-engine component	1,000 units
A's variable cost per unit of the tractor-engine component	\$120
A's fixed cost per unit of the tractor-engine component	\$ 20

1. Assume that there are no alternative uses for internal facilities of division A. Determine whether the company as a whole will benefit if division C purchases the component from external suppliers for \$135 per unit. What should the transfer price for the component be set at so that division managers acting in their own divisions' best interests take actions that are also in the best interest of the company as a whole?
2. Assume that internal facilities of division A would not otherwise be idle. By not producing the 1,000 units for division C, division A's equipment and other facilities would be used for other production operations that would result in annual cash-operating savings of \$18,000. Should division C purchase from external suppliers? Show your computations.
3. Assume that there are no alternative uses for division A's internal facilities and that the price from outsiders drops \$20. Should division C purchase from external suppliers? What should the transfer price for the component be set at so that division managers acting in their own divisions' best interests take actions that are also in the best interest of the company as a whole?

Required

22-26 Transfer-pricing problem (continuation of 22-25). Refer to Exercise 22-25. Assume that division A can sell the 1,000 units to other customers at \$155 per unit, with variable marketing cost of \$5 per unit.

Determine whether Allison-Chambers will benefit if division C purchases the 1,000 units from external suppliers at \$135 per unit. Show your computations.

Required

Problems

22-27 General guideline, transfer pricing. The Slate Company manufactures and sells television sets. Its assembly division (AD) buys television screens from the screen division (SD) and assembles the TV sets. The SD, which is operating at capacity, incurs an incremental manufacturing cost of \$65 per screen. The SD can sell all its output to the outside market at a price of \$100 per screen, after incurring a variable marketing and distribution cost of \$8 per screen. If the AD purchases screens from outside suppliers at a price of \$100 per screen, it will incur a variable purchasing cost of \$7 per screen. Slate's division managers can act autonomously to maximize their own division's operating income.

1. What is the minimum transfer price at which the SD manager would be willing to sell screens to the AD?
2. What is the maximum transfer price at which the AD manager would be willing to purchase screens from the SD?
3. Now suppose that the SD can sell only 70% of its output capacity of 20,000 screens per month on the open market. Capacity cannot be reduced in the short run. The AD can assemble and sell more than 20,000 TV sets per month.
 - a. What is the minimum transfer price at which the SD manager would be willing to sell screens to the AD?

Required

- b. From the point of view of Slate’s management, how much of the SD output should be transferred to the AD?
- c. If Slate mandates the SD and AD managers to “split the difference” on the minimum and maximum transfer prices they would be willing to negotiate over, what would be the resulting transfer price? Does this price achieve the outcome desired in requirement 3b?

22-28 Pertinent transfer price. Europa, Inc., has two divisions, A and B, that manufacture expensive bicycles. Division A produces the bicycle frame, and division B assembles the rest of the bicycle onto the frame. There is a market for both the subassembly and the final product. Each division has been designated as a profit center. The transfer price for the subassembly has been set at the long-run average market price. The following data are available for each division:

Selling price for final product	\$300
Long-run average selling price for intermediate product	200
Incremental cost per unit for completion in division B	150
Incremental cost per unit in division A	120

The manager of division B has made the following calculation:

Selling price for final product		\$300
Transferred-in cost per unit (market)	\$200	
Incremental cost per unit for completion	<u>150</u>	<u>350</u>
Contribution (loss) on product		<u>\$ (50)</u>

Required

1. Should transfers be made to division B if there is no unused capacity in division A? Is the market price the correct transfer price? Show your computations.
2. Assume that division A’s maximum capacity for this product is 1,000 units per month and sales to the intermediate market are now 800 units. Should 200 units be transferred to division B? At what transfer price? Assume that for a variety of reasons, division A will maintain the \$200 selling price indefinitely. That is, division A is not considering lowering the price to outsiders even if idle capacity exists.
3. Suppose division A quoted a transfer price of \$150 for up to 200 units. What would be the contribution to the company as a whole if a transfer were made? As manager of division B, would you be inclined to buy at \$150? Explain.

22-29 Pricing in imperfect markets (continuation of 22-28). Refer to Problem 22-28.

Required

1. Suppose the manager of division A has the option of (a) cutting the external price to \$195, with the certainty that sales will rise to 1,000 units or (b) maintaining the external price of \$200 for the 800 units and transferring the 200 units to division B at a price that would produce the same operating income for division A. What transfer price would produce the same operating income for division A? Is that price consistent with that recommended by the general guideline in the chapter so that the resulting decision would be desirable for the company as a whole?
2. Suppose that if the selling price for the intermediate product were dropped to \$195, sales to external parties could be increased to 900 units. Division B wants to acquire as many as 200 units if the transfer price is acceptable. For simplicity, assume that there is no external market for the final 100 units of division A’s capacity.
 - a. Using the general guideline, what is (are) the minimum transfer price(s) that should lead to the correct economic decision? Ignore performance-evaluation considerations.
 - b. Compare the total contributions under the alternatives to show why the transfer price(s) recommended lead(s) to the optimal economic decision.

22-30 Effect of alternative transfer-pricing methods on division operating income. Crango Products is a cranberry cooperative that operates two divisions, a harvesting division and a processing division. Currently, all of harvesting’s output is converted into cranberry juice by the processing division, and the juice is sold to large beverage companies that produce cranberry juice blends. The processing division has a yield of 500 gallons of juice per 1,000 pounds of cranberries. Cost and market price data for the two divisions are as follows:

					
	A	B	C	D	E
1	Harvesting Division			Processing Division	
2	Variable cost per pound of cranberries	\$0.10		Variable processing cost per gallon of juice produced	\$0.20
3	Fixed cost per pound of cranberries	\$0.25		Fixed cost per gallon of juice produced	\$0.40
4	Selling price per pound of cranberries in outside market	\$0.60		Selling price per gallon of juice	\$2.10

1. Compute Crango’s operating income from harvesting 400,000 pounds of cranberries during June 2012 and processing them into juice.
2. Crango rewards its division managers with a bonus equal to 5% of operating income. Compute the bonus earned by each division manager in June 2012 for each of the following transfer pricing methods:
 - a. 200% of full cost
 - b. Market price
3. Which transfer-pricing method will each division manager prefer? How might Crango resolve any conflicts that may arise on the issue of transfer pricing?

Required

22-31 Goal-congruence problems with cost-plus transfer-pricing methods, dual-pricing system (continuation of 22-30). Assume that Pat Borges, CEO of Crango, had mandated a transfer price equal to 200% of full cost. Now he decides to decentralize some management decisions and sends around a memo that states the following: “Effective immediately, each division of Crango is free to make its own decisions regarding the purchase of direct materials and the sale of finished products.”

1. Give an example of a goal-congruence problem that will arise if Crango continues to use a transfer price of 200% of full cost and Borges’s decentralization policy is adopted.
2. Borges feels that a dual transfer-pricing policy will improve goal congruence. He suggests that transfers out of the harvesting division be made at 200% of full cost and transfers into the processing division be made at market price. Compute the operating income of each division under this dual transfer pricing method when 400,000 pounds of cranberries are harvested during June 2012 and processed into juice.
3. Why is the sum of the division operating incomes computed in requirement 2 different from Crango’s operating income from harvesting and processing 400,000 pounds of cranberries?
4. Suggest two problems that may arise if Crango implements the dual transfer prices described in requirement 2.

Required

22-32 Multinational transfer pricing, global tax minimization. Industrial Diamonds, Inc., based in Los Angeles, has two divisions:

- South African mining division, which mines a rich diamond vein in South Africa
- U.S. processing division, which polishes raw diamonds for use in industrial cutting tools

The processing division’s yield is 50%: It takes 2 pounds of raw diamonds to produce 1 pound of top-quality polished industrial diamonds. Although all of the mining division’s output of 8,000 pounds of raw diamonds is sent for processing in the United States, there is also an active market for raw diamonds in South Africa. The foreign exchange rate is 6 ZAR (South African Rand) = \$1 U.S. The following information is known about the two divisions:

	Home	Insert	Page Layout	Formulas	Data	Review
	A	B	C	D	F	G
1	South African Mining Division					
2	Variable cost per pound of raw diamonds				600	ZAR
3	Fixed cost per pound of raw diamonds				1,200	ZAR
4	Market price per pound of raw diamonds				3,600	ZAR
5	Tax rate				25%	
6						
7	U.S. Processing Division					
8	Variable cost per pound of polished diamonds				220	U.S. dollars
9	Fixed cost per pound of polished diamonds				850	U.S. dollars
10	Market price per pound of polished diamonds				3,500	U.S. dollars
11	Tax rate				40%	

1. Compute the annual pretax operating income, in U.S. dollars, of each division under the following transfer-pricing methods: (a) 250% of full cost and (b) market price.
2. Compute the after-tax operating income, in U.S. dollars, for each division under the transfer-pricing methods in requirement 1. (Income taxes are not included in the computation of cost-based transfer price, and Industrial Diamonds does not pay U.S. income tax on income already taxed in South Africa.)
3. If the two division managers are compensated based on after-tax division operating income, which transfer-pricing method will each prefer? Which transfer-pricing method will maximize the total after-tax operating income of Industrial Diamonds?
4. In addition to tax minimization, what other factors might Industrial Diamonds consider in choosing a transfer-pricing method?

Required

22-33 International transfer pricing, taxes, goal congruence. Argone division of Gemini Corporation is located in the United States. Its effective income tax rate is 30%. Another division of Gemini, Calcia, is located in Canada, where the income tax rate is 42%. Calcia manufactures, among other things, an intermediate product for Argone called IP-2007. Calcia operates at capacity and makes 15,000 units of IP-2007 for Argone each period, at a variable cost of \$60 per unit. Assume that there are no outside customers for IP-2007. Because the IP-2007 must be shipped from Canada to the United States, it costs Calcia an additional \$4 per unit to ship the IP-2007 to Argone. There are no direct fixed costs for IP-2007. Calcia also manufactures other products.

A product similar to IP-2007 that Argone could use as a substitute is available in the United States for \$75 per unit.

Required

1. What is the minimum and maximum transfer price that would be acceptable to Argone and Calcia for IP-2007, and why?
2. What transfer price would minimize income taxes for Gemini Corporation as a whole? Would Calcia and Argone want to be evaluated on operating income using this transfer price?
3. Suppose Gemini uses the transfer price from requirement 2, and each division is evaluated on its own after-tax division operating income. Now suppose Calcia has an opportunity to sell 8,000 units of IP-2007 to an outside customer for \$68 each. Calcia will not incur shipping costs because the customer is nearby and offers to pay for shipping. Assume that if Calcia accepts the special order, Argone will have to buy 8,000 units of the substitute product in the United States at \$75 per unit.
 - a. Will accepting the special order maximize after-tax operating income for Gemini Corporation as a whole?
 - b. Will Argone want Calcia to accept this special order? Why or why not?
 - c. Will Calcia want to accept this special order? Explain.
- d. Suppose Gemini Corporation wants to operate in a decentralized manner. What transfer price should Gemini set for IP-2007 so that each division acting in its own best interest takes actions with respect to the special order that are in the best interests of Gemini Corporation as a whole?

22-34 Transfer pricing, goal congruence. The Bosh Corporation makes and sells 20,000 multisystem music players each year. Its assembly division purchases components from other divisions of Bosh or from external suppliers and assembles the multisystem music players. In particular, the assembly division can purchase the CD player from the compact disc division of Bosh or from Hawei Corporation. Hawei agrees to meet all of Bosh's quality requirements and is currently negotiating with the assembly division to supply 20,000 CD players at a price between \$44 and \$52 per CD player.

A critical component of the CD player is the head mechanism that reads the disc. To ensure the quality of its multisystem music players, Bosh requires that if Hawei wins the contract to supply CD players, it must purchase the head mechanism from Bosh's compact disc division for \$24 each.

The compact disc division can manufacture at most 22,000 CD players annually. It also manufactures as many additional head mechanisms as can be sold. The incremental cost of manufacturing the head mechanism is \$18 per unit. The incremental cost of manufacturing a CD player (including the cost of the head mechanism) is \$30 per unit, and any number of CD players can be sold for \$45 each in the external market.

Required

1. What are the incremental costs minus revenues from sale to external buyers for the company as a whole if the compact disc division transfers 20,000 CD players to the assembly division and sells the remaining 2,000 CD players on the external market?
2. What are the incremental costs minus revenues from sales to external buyers for the company as a whole if the compact disc division sells 22,000 CD players on the external market and the assembly division accepts Hawei's offer at (a) \$44 per CD player or (b) \$52 per CD player?
3. What is the minimum transfer price per CD player at which the compact disc division would be willing to transfer 20,000 CD players to the assembly division?
4. Suppose that the transfer price is set to the minimum computed in requirement 3 plus \$2, and the division managers at Bosh are free to make their own profit-maximizing sourcing and selling decisions. Now, Hawei offers 20,000 CD players for \$52 each.
 - a. What decisions will the managers of the compact disc division and assembly division make?
 - b. Are these decisions optimal for Bosh as a whole?
 - c. Based on this exercise, at what price would you recommend the transfer price be set?

22-35 Transfer pricing, goal congruence, ethics. Jeremiah Industries manufactures high-grade aluminum luggage made from recycled metal. The company operates two divisions: metal recycling and luggage fabrication. Each division operates as a decentralized entity. The metal recycling division is free to sell sheet aluminum to outside buyers, and the luggage fabrication division is free to purchase recycled sheet aluminum from other sources. Currently, however, the recycling division sells all of its output to the fabrication division, and the fabrication division does not purchase materials from any outside suppliers.

Aluminum is transferred from the recycling division to the fabrication division at 110% of full cost. The recycling division purchases recyclable aluminum for \$0.50 per pound. The division's other variable costs equal \$2.80 per pound, and fixed costs at a monthly production level of 50,000 pounds are \$1.50 per pound.

During the most recent month, 50,000 pounds of aluminum were transferred between the two divisions. The recycling division's capacity is 70,000 pounds.

Due to increased demand, the fabrication division expects to use 60,000 pounds of aluminum next month. Metalife Corporation has offered to sell 10,000 pounds of recycled aluminum next month to the fabrication division for \$5.00 per pound.

1. Calculate the transfer price per pound of recycled aluminum. Assuming that each division is considered a profit center, would the fabrication manager choose to purchase 10,000 pounds next month from Metalife?
2. Is the purchase in the best interest of Jeremiah Industries? Show your calculations. What is the cause of this goal incongruence?
3. The fabrication division manager suggests that \$5.00 is now the market price for recycled sheet aluminum, and that this should be the new transfer price. Jeremiah's corporate management tends to agree. The metal recycling manager is suspicious. Metalife's prices have always been considerably higher than \$5.00 per pound. Why the sudden price cut? After further investigation by the recycling division manager, it is revealed that the \$5.00 per pound price was a one-time-only offer made to the fabrication division due to excess inventory at Metalife. Future orders would be priced at \$5.50 per pound. Comment on the validity of the \$5.00 per pound market price and the ethics of the fabrication manager. Would changing the transfer price to \$5.00 matter to Jeremiah Industries?

Required

Collaborative Learning Problem

22-36 Transfer pricing, utilization of capacity. (J. Patell, adapted) The California Instrument Company (CIC) consists of the semiconductor division and the process-control division, each of which operates as an independent profit center. The semiconductor division employs craftsmen who produce two different electronic components: the new high-performance Super-chip and an older product called Okay-chip. These two products have the following cost characteristics:

	Super-chip	Okay-chip
Direct materials	\$ 5	\$ 2
Direct manufacturing labor, 3 hours × \$20; 1 hour × \$20	60	20

Due to the high skill level necessary for the craftsmen, the semiconductor division's capacity is set at 45,000 hours per year.

Maximum demand for the Super-chip is 15,000 units annually, at a price of \$80 per chip. There is unlimited demand for the Okay-chip at \$26 per chip.

The process-control division produces only one product, a process-control unit, with the following cost structure:

- Direct materials (circuit board): \$70
- Direct manufacturing labor (3 hours × \$15): \$45

The current market price for the control unit is \$132 per unit.

A joint research project has just revealed that a single Super-chip could be substituted for the circuit board currently used to make the process-control unit. Direct labor cost of the process-control unit would be unchanged. The improved process-control unit could be sold for \$145.

1. Calculate the contribution margin per direct-labor hour of selling Super-chip and Okay-chip. If no transfers of Super-chip are made to the process-control division, how many Super-chips and Okay-chips should the semiconductor division manufacture and sell? What would be the division's annual contribution margin? Show your computations.
2. The process-control division expects to sell 5,000 process-control units this year. From the viewpoint of California Instruments as a whole, should 5,000 Super-chips be transferred to the process-control division to replace circuit boards? Show your computations.
3. What transfer price, or range of prices, would ensure goal congruence among the division managers? Show your calculations.
4. If labor capacity in the semiconductor division were 60,000 hours instead of 45,000, would your answer to requirement 3 differ? Show your calculations.

Required