CHAPTER 10

COVERAGE OF LEARNING OBJECTIVES

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **LEARNING OBJECTIVE** | **FUNDA-**  **MENTAL** ASSIGN-MENT **MATERIAL** | **CRITICAL THINKING**  **EXERCISES AND EXERCISES** | **PROBLEMS** | **CASES, EXCEL,**  **COLLAB., & INTERNET EXERCISES** |
| **LO1: Define decentralization and identify its expected benefits and costs.** | **A2, A4, B4** | **25, 26** |  | **59, 60** |
| **LO2: Distinguish between responsibility centers and decentralization.** |  |  | **46** | **55** |
| **LO3: Explain how the linking of rewards to responsibility center results affects incentives and risk.** |  | **23** | **37, 43** |  |
| **LO4: Compute ROI, economic profit and economic value added (EVA).** | **A1, A4, B2, B4** | **27, 28, 29, 30, 31,32,33** | **38, 40, 41, 42, 44** | **57, 58** |
| **LO5: Compare the incentives created by income, ROI, and EVA performance measures.** | **B1,** | **24, 25** | **39, 40, 43, 44, 45, 54** |  |
| **LO6: Define transfer prices and identify their purpose.** | **A2, A3, A4, B3, B4** | **26** | **46, 47, 48, 49, 50, 51, 54** | **55** |
| **LO7: State the general rule for transfer pricing and use it to assess transfer prices based on total costs, variable costs, and market prices.** | **A2, A3, A4, B1, B3, B4** | **34, 35** | **46, 47, 48, 49, 52, 54** | **55** |
| **LO8: Identify the factors affecting multinational transfer prices.** |  | **36** | **53** |  |
| **LO9: Explain how controllability and management by objectives (MBO) aid the implementation of management control systems.** |  |  |  | **56** |

**CHAPTER 10**

***Management Control in Decentralized Organizations***

10-A1 (10-15 min.) Dollar amounts are in thousands.

Division

Hubert Duane Louis

Return on sales:

$180 ÷ $3,600 5%

$84 ÷ $1,200 7%

$216 ÷ $9,000 2.4%

Capital turnover:

$3,600 ÷ $2,000 1.8

$1,200 ÷ $600 2

$9,000 ÷ $1,800 5

Rate of return on invested capital:

$180 ÷ $2,000 (or 1.8 × 5%) 9%

$84 ÷ $600 (or 2 × 7%) 14%

$216 ÷ $1,800 (or 5 × 2.4%) 12%

2. If ROI is used for judging relative performance, Duane is best for this period. Other factors deserving discussion include the risks faced by each division and the short-run versus long-run implications of current performance.

3. Division

Hubert Duane Louis

Income $180 $84 $216

Cost of capital 200 60 180

Economic profit $ –20 $ 24 $ 36

Louis Division has the highest economic profit, even though it has a slightly lower ROI than does Duane. Hubert Division is earning less than its cost of capital and has a negative economic profit.

10-A2 (30 min.)

1. Assume that fixed costs will continue. The company as a whole will be worse off if Lucerne buys from outside supplier:

## Purchase costs from outside supplier, 3,000

units at CHF300 CHF900,000

Less: Savings in variable costs by reducing

Geneva's output, 3,000 at CHF280 840,000

Disadvantage to company as a whole from purchase CHF 60,000

2. Company will benefit if Lucerne buys outside:

## Purchase costs from outsider, 3,000 units

## at CHF300 CHF900,000

Less:

## Savings in variable costs as above CHF840,000

## Contribution from other production

operations 85,000 925,000

Advantage to company as a whole from purchase CHF 25,000

3. Company will benefit if Lucerne buys on outside:

## Purchase costs from outsider,

## 3,000 units at CHF250 CHF750,000

Less: Savings in variable costs by reducing

Geneva’s output, 3,000 at CHF 280 (as above) CHF840,000

Advantage to company as a whole from purchase CHF 90,000

4. As president, I would not want to become immersed in these disputes. If arbitration is necessary, it probably should be conducted by some other officer on the corporate staff. One possibility is to have the immediate line boss of the two managers make a decision.

If decentralization is to be strictly adhered to, the arbitrator probably should not intervene under any of the conditions described. If no forced transfer were made, Lucerne would probably go outside, resulting in an optimal decision for the overall company under the assumptions in parts (2) and (3) but not under the assumptions in part (1).

Of course, in part (1) if the manager of Geneva understood cost-volume-profit relationships and wanted to maximize the division’s short-run net income, he or she would probably accept a price of CHF300. This would bring a contribution to the divisional profit of 3,000 × (CHF300 - CHF280), or CHF60,000.

Suppose, however, that Geneva refuses to meet the price of CHF300. This would mean that the company will be CHF60,000 poorer in the short run. Should top management interfere and force a transfer at CHF300? This would undercut the philosophy of decentralization. Many managers would not interfere because they would view the CHF60,000 as the price that has to be paid for true decentralization. But how high must this price go before the temptation to interfere would be irresistible? CHF70,000? CHF80,000? How much? On the other hand, the Geneva manager may realize that CHF60,000 is being sacrificed but may have decided that it is worth more than CHF60,000 to achieve some long-term subjective benefits.

In sum, the point of this question is that any structure that interferes with lower-level decision-making weakens decentralization. Of course, such interference may occasionally be necessary to prevent horrendous blunders. But recurring interference and constraints simply transform a decentralized organization into a centralized organization.

10-A3 (10 min.)

The company as a whole would benefit because the CHF60,000 disadvantage of purchasing from an outside supplier calculated in 10-A2 Part 1 would be more than offset by the additional contribution margin on sales by Geneva to other customers:

Geneva's sales to other customers,

3,000 units at CHF330 CHF990,000

Variable costs, at CHF305 915,000

Contribution margin CHF 75,000

The net advantage would be CHF75,000 - CHF60,000, or CHF15,000.

10-A4 (30-35 min.)

1. a. 20% of $960,000 = $192,000 target operating income

## Let X = Unit sales price

## Dollar sales = Variable expenses + Fixed expenses + Operating income

150,000X = (150,000 × $.72) + $300,000 + $192,000

## X = $600,000 ÷ 150,000 = $4.00

b. Expected capital turnover = $600,000 ÷ $960,000 = .625

1. Return on sales = $192,000 ÷ $600,000 = 32%

2. a, b.

Sales Volume

150,000 170,000 130,000

Units\* Units Units

Sales, at $4.00 $600,000 $680,000 $520,000

Variable expense, at $.72 $108,000 $122,400 $ 93,600

Fixed expenses 300,000 300,000 300,000

Total expenses $408,000 $422,400 $393,600

Operating income $192,000 $257,600 $126,400

Rate of return on $960,000

assets 20.0% 26.83% 13.17%

\*Column not required.

A summary analysis of these three cases, in equation form, follows:

Return Capital Turn- Rate of

on Sales × over = Return

Volume 150,000 32.00% × .6250 = 20.0%

Volume 170,000 37.88% × .7083 = 26.83%

Volume 130,000 24.31% × .5417 = 13.17%

3. If the units are not sold to the other division, average available assets would decrease by $150,000, from $960,000 to $810,000. Fixed overhead would be reduced to $300,000 - $22,500 = $277,500. Results would be:

Sell Sell Difference

105,000 150,000 45,000

Units Units Units

Sales, 105,000×$4.00; 45,000×$2.25 $420,000 $521,250 $101,250

Variable expenses, at $.72 $ 75,600 $108,000 $ 32,400

Fixed expenses 277,500 300,000 22,500

Total expenses $353,100 $408,000 $ 54,900

Operating income $ 66,900 $113,250 $ 46,350

Total assets needed $810,000 $960,000 $150,000

Rate of return on assets 8.26% 11.80% 30.9%

Based on the information given, he should sell at the $2.25 price. Both divisions and the company as a whole will benefit from such a decision. Although the original overall target rate of return of 20% is unattainable, the division will nevertheless earn a better rate of return on assets with the intracompany business than without it. The additional units will earn a 30.9% incremental rate of return, which exceeds the 8.26% rate earned on 105,000 units. As a result, the overall rate of return would increase from 8.26% to 11.80%, as shown in the schedule above.

Despite this economic analysis, the Austin Division manager may still decide against transferring goods at such a low price. For example, he may feel entitled to a higher profit. This would mean that the company would be worse off, assuming the incremental costs of the other division are $2.25.

Should top management interfere and force a transfer of $2.25? Such intervention would weaken the decentralization structure. Obviously, authoritarian action sometimes may be needed to prevent costly mistakes. But recurring interference by top management effectively transforms a decentralized organization into a centralized organization. Of course, if managers repeatedly make costly dysfunctional decisions, a more centralized organizational design may be desirable.

10-B1 (30-45 min.)

1. The percentage return for each project is as follows:

Percentage

Project Return

1 $1,200,000 ÷ $4,800,000 = 25%

2 $ 627,000 ÷ $1,900,000 = 33%

3 $ 182,000 ÷ $1,400,000 = 13%

4 $ 152,000 ÷ $ 950,000 = 16%

5 $ 136,500 ÷ $ 650,000 = 21%

6 $ 90,000 ÷ $ 300,000 = 30%

a. Under assumption (a), projects 1, 2, 4, 5, and 6 would be taken.

Total investment $8,600,000

Total return $2,205,500

Return on investment 25.65%

Economic profit $ 485,500\*

\*$2,205,500 - ($8,600,000 × .20)

The manager taking the above projects would be following the company rule.

b. Under assumption (b), the rational manager will take only project 2, since this gives a return on investment of $627,000 ÷ $1,900,000 = 33% (and an economic profit of $627,000 - ($1,900,000 × .20) = $247,000). Adding any further projects at lower returns lowers the overall return on capital invested. Note that if this were not a new division, the manager under this alternative would select those projects that have a higher expected rate of return than the existing rate of return.

c. Under assumption (c), the manager will take projects 1, 2, 5 and 6, which have returns greater than the cost of capital.

Total investment $7,650,000

Total income $2,053,500

Return on investment (2,053,500 7,650,000) 26.84%



Economic profit $ 523,500\*

\*$2,053,500 - ($7,650,000 × .20)

2. The essence of the concept of economic profit is that it requires the manager to take all projects that promise a return to the company over and above the cost of the capital invested. This will maximize total return to the company for the capital it has available. To maximize ROI means that the company takes only the highest ROI projects. To use a required rate of 15% means that the company is investing in unprofitable opportunities where the return is lower than the 20% cost of capital. For example, by taking project 4 in (a), the division manager lowered the economic profit since its return on investment of 16% is less than the cost of the capital of 20%.

10-B2 (10 min.) Amounts are in millions.

1. 20X4 20X5

Pretax operating income $6,105 $6,100

Less: Cash taxes (1,686) (1,620)

Operating income after tax 4,419 4,480

Less: Capital charge (14% × $16,125

and 14% × $18,110) (2,258) (2,535)

EVA $2,161 $1,945

2. Although profit after tax increased slightly in 20X5, EVA decreased by ($1,945 - $2,161) ÷ $2,161 = 10%, primarily due to the increase in average invested capital and corresponding increase in the charge for invested capital. Therefore, the company created less value for its shareholders in 20X5 than in 20X4.

10-B3 (20 min.)

The appropriate transfer price is the market price of $3.35 per gallon. As long as the market price is met, the buying divisions must purchase from the internal divisions. At this price, both divisions have incentives to make choices that maximize operating income for the corporation as a whole. At this price, the analysis by the manager of the ice cream machine shows the overall effect on company profit (and the manager of Okemos Drive-In is indifferent between inside versus outside purchase because the cost to Okemos Drive-In is the same under either option):

Ice Cream Machine

Including Excluding

Sales to Sales to

Okemos Okemos

Drive-In Drive-In

Sales\* $61,400 $48,000

Variable costs @ $2.00 32,000 24,000

Contribution margin $29,400 $24,000

Fixed costs 13,600 12,700

Operating margin $15,800 $11,300

\*12,000 gallons @ $4 + 4,000 gallons @ $3.35; 12,000 gallons @ $4

This can also be seen by analyzing overall company operating income, which is higher by $4,500 with sales to Okemos Drive-In:

Cost of purchase from outside $13,400

Less: Incremental cost of inside production

Incremental fixed costs (900)

Variable costs, 4,000 gallons @ $2.00 (8,000)

Net savings from inside purchases $4,500

10-B4 (30-45 min.)

1. a. Contribution margin per unit = ¥7,350 - ¥4,900 = ¥2,450

Total contribution = ¥2,450 × 3,350 units = ¥8,207,500

Operating income = ¥8,207,500 - ¥5,700,000 = ¥2,507,500

ROI = ¥2,507,500 ÷ ¥16,000,000 = 15.67%

b. Revenue = ¥7,350 × 3,350 units = ¥24,622,500

Capital turnover = ¥24,622,500 ÷ ¥16,000,000 = 1.539

1. Return on sales

= ¥2,507,500 ÷ ¥24,622,500 = 10.18%

2. a. Desired operating income

= 24% × ¥16,000,000 = ¥3,840,000

Let X = units to be sold to reach desired return

¥2,450 × X units = ¥5,700,000 + ¥3,840,000

X = ¥9,540,000 ÷ ¥2,450 = 3,894 units

b. Let Z = required decrease in total assets

Operating income ÷ total assets = .24

(¥2,507,500 + .1Z) ÷ (¥16,000,000 - Z) = .24

.34Z = ¥1,332,500

Z = ¥3,919,118

Operating income = ¥2,507,500 + .1 × (¥3,919,118) =

¥2,899,412

Total assets = ¥16,000,000 - ¥3,919,118 =

¥12,080,882

ROI = ¥2,899,412 ÷ ¥12,080,882 = 24%

3. Examine the operating income and rate of return on assets with and without the 1,200-unit transfer (amounts are thousands of Japanese Yen):

Sell Sell Difference

2,950 4,150 1,200

units units units

## Sales, 2,950 units @ ¥7,350

and 1,200 units @ ¥6,150 21,682.5 29,062.5 7,380

Variable costs, ¥4,900/unit 14,455.0 20,335.0 5,880

Fixed costs 5,400.0 5,700.0 300

Total costs 19,855.0 26,035.0 6,180

Operating income 1,827.5 3,027.5 1,200

Total assets needed 11,000 16,000 5,000

Rate of return on assets 16.6% 18.9% 24%

Based on the information given, the Sendai division should sell 1,200 units to the European Marketing division at the ¥6,150 price. Both divisions and the company as a whole will benefit from such a decision. Although the original overall target rate of return of 24% is unattainable, the division will nevertheless earn a better rate of return with the intracompany business than without it. The additional units earn a 24% incremental rate of return, which exceeds the 16.6% rate earned on 2,950 units. As a result, the overall rate of return will increase from 16.6% to 18.9%, as shown in the schedule above. In addition, the extra sales meet the return target of 24%.

Despite this economic analysis, the Sendai manager may still decide against transferring goods at such a low price. For example, he may feel entitled to a higher profit. This would mean that the company would be worse off in the short run if the European Marketing division must pay the equivalent of ¥6,150 to purchase the games elsewhere. Should top management interfere and force a transfer at ¥6,150? Such intervention would weaken the decentralization structure. Obviously, top management intervention sometimes may be needed to prevent costly mistakes. But recurring interference and constraints simply transform a decentralized organization into a centralized organization. Of course, if managers repeatedly make costly dysfunctional decisions, the costs of decentralization may exceed the benefits. Then a more centralized organizational design may be desirable. Further, the Sendai manager may acknowledge the ¥1,200,000 loss by not transferring but believe that some long-run objective is worth the ¥1,200,000 short-term sacrifice.

10-1 Benefits of decentralization include: 1) lower-level managers may make better decisions because they have better knowledge of local conditions; 2) managers develop their management skills so that there are more managers qualified to move up in the organization; and 3) managers have higher status and therefore are more highly motivated.

Costs of decentralization include: 1) managers may make decisions that are not in the best interest of the organization because they are not aware of or not interested in facts that don't pertain to their own segment; 2) managers may perform functions at the division level that would be less costly if centralized; and 3) the cost of information to coordinate and control activities may increase with decentralization.

10-2 One of the limitations in decentralization is lack of knowledge in segments of the organization. This is especially true in geographically decentralized operations. Accounting systems give a common language and structure for sharing information throughout an organization. Sophisticated communications systems make this information available without delay. Many companies have “data warehouses” that let managers anywhere in the organization have immediate access to whatever accounting information they want.

10-3 It is more difficult to hold managers of nonprofit organizations responsible for performance because inputs and outputs are generally more difficult to measure. Without reliable performance measures, granting managerial freedom is more risky.

10-4 No. Profit centers facilitate decentralization, but one can exist without the other. They are different concepts, as the chapter explains.

10-5 Decentralization is usually most successful in organizations where segments are relatively independent. If segments buy from or sell to one another, or if there are many common customers or suppliers, decentralization is less likely to be desirable.

10-6 Employment contracts must balance the incentives created for managers, the risk imposed on managers, and the cost of developing and using the performance measurement system

10-7 The major advantage of the rate of return analysis of performance is its attention to the required asset investment in relation to operating income. A percentage return is also a common measure that is familiar to managers.

10-8 ROI is affected by a division’s income and the amount of its investment. You can also think of ROI as the product of return on sales and capital turnover.

10-9 The major difference is that economic profit includes a capital charge, that is, a cost of using all capital. In contrast, net income includes a charge for using debt capital (interest) but no charge for using equity capital. Some measures of economic profit rely primarily on financial reporting numbers and others, such as EVA, include adjustments such as deducting cash taxes rather than tax expense or capitalizing rather than expensing R&D.

10-10 Economic value added (EVA) is after-tax operating income minus the after-tax weighted-average cost of capital multiplied by the sum of average long-term liabilities and stockholders’ equity. Companies can improve EVA by

* Investing in products or projects that generate more after-tax operating income than the cost of the capital used,
* Divesting products or projects that do not generate enough after-tax operating income to cover the cost of the capital used,
* Reducing the weighted-average cost of capital, and
* Increasing the after-tax operating income without using more invested capital
* Decreasing invested capital without decreasing after-tax operating income.

An alternative definition of the capital charge portion of the EVA equation is the product of the after-tax weighted-average cost of capital multiplied by the sum of average working capital and non-current assets. The equivalency of these two definitions can be shown as follows:

Total assets = Total liabilities + Stockholders' equity

Current assets + Non-current assets = Current liabilities + Long-term debt + Stockholders' equity

Current assets - Current liabilities + Non-current assets = Long-term debt + Stockholder's equity

The right-hand side of the above equation represents the capital structure of an organization - that is, how capital is financed. The left-hand side represents the actual capital -- working capital and non-current assets. Either definition can be used.

10-11 Division A’s manager would reject the proposed project because it would reduce the division’s ROI. Division B’s manager would accept the proposed project because it would increase the division’s ROI. If evaluation is based on economic profit, both managers would be motivated to accept the proposed project because the project’s return is greater than the imputed cost of invested capital.

10-12 Three possible definitions of invested capital are:

1. Total assets

2. Total assets less current liabilities

3. Stockholders' equity

10-13 There is some truth to this statement. However, using a historical cost accounting system with budgets is not backward looking. Budgets force managers to plan for the future, including predicting future prices.

10-14 The use of gross book value rather than net book value of assets to compute ROI may affect the speed with which managers replace assets. Gross book value leads to more rapid replacement. A manager who suggests using gross book value probably has assets that are relatively new compared to those in other divisions. When net book value is used, the manager's relatively new assets are valued considerably higher than older assets because they have little accumulated depreciation. When gross book value is used, accumulated depreciation is irrelevant and there is less difference between the values of older assets and newer assets.

10-15 Companies need transfer-pricing systems to accurately determine the efficiency of various divisions of a company's operation when using profit or investment centers. If inefficiency exists somewhere in a corporation that does not employ a transfer - pricing system, it is much harder to pin down the area or process that is most directly responsible. In addition, transfer pricing is an attention-directing device that highlights good performance and motivates personnel to maintain efficiency. Transfer pricing systems also preserve segment autonomy.

10-16 Using full costs can mask the real behavior of a cost. Any transfer price that includes a fixed cost element makes a fixed cost in the producing department look like a variable cost to the buying department. Using actual costs can pass on inefficiencies and make planning difficult for the buying department. The amount of the transfer is not known until actual costs are available, and factors beyond the control of the buying department can affect the transfer price.

10-17 If a producing division has idle capacity, a transfer price at the variable cost will usually be optimal. Why? Because it costs the firm as a whole only the variable costs to produce the item to be transferred. However, if there is not idle capacity, the selling (producing) division, and hence the firm as a whole, gives up the contribution it would obtain from selling to outside customers or using the resource for some other use. A higher transfer price that reflects the opportunity cost would be optimal in order to assure that the value to the buying division is at least as great as the sacrifice made by the selling division to transfer the item internally.

10-18 Variable-cost transfer prices can also lead to dysfunctional decisions. For example, in a situation where the producing division has no excess capacity, variable-cost transfers may cause dysfunctional decisions.

10-19 Negotiated transfer prices are likely to lead to better transfer pricing decisions because those with the best knowledge are making the decisions. On the other hand, valuable time and effort can be lost in the negotiating process. Further, with negotiated transfer prices, divisional profit becomes a function of negotiating ability and power.

10-20 Multinational transfer prices are influenced by the relative income-tax rates in the countries in which the producing and purchasing divisions are located. They are also influenced by import duties and restrictions on flows of capital between countries.

10-21 In organizations using management by objectives (MBO), managers and their superiors jointly formulate and agree on the goals and plans for the forthcoming period. Managers are then evaluated against these agreed-upon goals and plans.

10-22 When making performance targets becomes too important, managers may be tempted to manipulate the numbers to meet their targets. Such pressures can result in unethical behavior.

10-23 A decision to decentralize is based on a desire to achieve specific objectives in a particular environment. If a company’s objectives change or its environment change, a different level of decentralization may be appropriate. Further, companies try to achieve a balance between centralization and decentralization, but sometimes a movement in one direction or another over-shoots its target and a retrenchment is needed.

10-24 No. ROI and economic profit create different motivations for managers. Goal congruence and managerial effort would usually be accomplished better by economic profit.

10-25 Profit measures and other performance measures by themselves do not cause unethical behavior. However, the way managers use them may. Managers charged with meeting performance targets by whatever means possible might resort to unethical means. Thus, it is important that management control systems not only include the right performance measures, but they must also specify how management should use these measures in evaluating managers.

10-26 When top management second-guesses divisional managers frequently, many advantages of decentralization are lost. Segment autonomy disappears. Essentially, top management intervention implies that top managers know more about the local market conditions than do segment managers. If this is indeed the case, a decentralized operation may not be appropriate.

10-27 (10 min.) Dollar amounts are in thousands.

1. Turnover of capital = Sales ÷ Invested capital

= $227,500÷ $65,000

= 350%, or 3.5 times

2. Return on sales = $9,100÷ $227,500

= 4.0%

3. Return on Investment (ROI) = $9,100 ÷ $65,000 = 14%

or = 3.5 × 4.0% = 14%

10-28 (5 min.)

The basic equation: ROI = Return on Sales × Capital turnover

A: 6% × 3 = 18%

B: 18% ÷ 4% = 4.5

C: 20% ÷ 5 = 4%

10-29 (15-20 min.)

1. The filled-in blanks are underscored:

Division

X Y Z

Invested capital $1,050,000 $1,360,000 $1,200,000

Income $ 69,300 $ 142,800 $ 210,000

Revenue (sales) $2,310,000 $2,856,000 $4,200,000

Return on sales,

Income ÷ Sales 3% 5% 5%

Capital turnover,

Sales ÷ Invested capital 2.2 2.1 3.5

Return on invested capital,

Income ÷ Invested capital 6.6% 10.5% 17.5%

2. Division

X Y Z

Income $ 69,300 $142,800 $210,000

Capital charge 105,000 136,000 120,000

Economic profit ($ 35,700) $ 6,800 $ 90,000

3. If the criterion for judging relative performance is ROI, Division Z is best for this period. If the criterion is economic profit, then both Division Y and Division Z are producing positive economic profit, with Division Z producing more. Other factors deserving attention include the relative risks faced by each division and the short-run versus long-run implications of current performance.

10-30 (10 – 15 min.) Dollar amounts are in thousands.

1.

20X1: Adjusted net operating profit after tax

($78,000 - $20,500) $ 57,500

Capital charge ( .094 × $650,000) 61,100

EVA $ (3,600)

20X2: Adjusted net operating profit after tax

($80,000 - $22,600) $57,400

## Capital charge (.094 × $600,000) 56,400

## EVA $ 1,000

1. Lohmann’s overall performance improved, with EVA increasing from a negative $3,600 to a positive $1,000. Although adjusted after-tax operating profit decreased by $100, this was more than offset by the decrease of $4,700 in the capital charge, resulting in the net EVA increase of $4,600.

10-31 (20 min.)

1. Hope Crosby

Assets $3,000,000 $3,000,000

Liabilities 1,240,000 0

Stockholders’ equity 1,760,000 3,000,000

Income before interest 690,000 690,000

12% interest 148,800 0

Net income $ 541,200 $ 690,000

Rate of return on:

Assets 18% 23%

Stockholders equity 30.8%\* 23%

\*$541,200 ÷ 1,760,000 = 30.8%

2. The gross rate of return on assets (before considering interest expense) is 690,000 ÷ 3,000,000 = 23%. For Crosby, with no debt in the capital structure, the return on assets and return on stockholders’ equity are the same. For Hope, with a large amount of debt in the capital structure, there is a large impact of debt on the net return on assets (after interest expense) and return on stockholders' equity.

Hope Company in effect has paid 12% for the use of $1,240,000, which in turn has earned a gross return of 23%, yielding a lower net return on assets of 18% and a much higher return on equity of 30.8%. When the return on assets is higher than the cost of debt, as in this example, a larger proportion of debt in the capital structure benefits stockholders. However, when the gross rate of return on assets is lower than the cost of debt, a larger proportion of debt hurts stockholders.

Top management has two major functions: operating and financing. Measures of operational performance (how assets are employed) should not be combined with measures that reflect the effects of financing decisions (how funds for investing are obtained).

10-32 (20-30 min.) This problem presses the student more than those immediately preceding it. Dollar amounts are in thousands.

1. Division

J K L

Income: .27 × $5,000;

.16 × $20,000 $ 450 $ 1,350 $ 3,200

Revenue: $450 ÷ .05;

$1,350 ÷ .09;

2 × $20,000 $9,000 $15,000 $40,000

Invested capital: $9,000 ÷ 6 $1,500 $ 5,000 $20,000

Return on sales, 16% ÷ 2 5% 9% 8%

Capital turnover, 27% ÷ 9% 6 3 2

Rate of return on invested capital,

$450 ÷ $1,500 30% 27% 16%

Cost of capital 7% 14% 15%\*

Economic profit,

$450 - (.07 × $1,500);

$1,350 - (.14 × $5,000) $ 345 $ 650 $ 200

\*$3,200- $200= $3,000;

$3,000 ÷ $20,000 = 15%

2. This requirement can generate much discussion or little discussion, as the instructor desires. Using ROI as the criterion, J is the best performer. Using economic profit as the criterion, K is the best performer. Note that this company uses different interest rates for different divisions, probably because of wide variations in risks. Note, too, that economic profit, an absolute amount, is usually easier to generate by large divisions.

10-33 (15 min.)

1 & 2.

(2) (1)

Income Net Rate Gross Rate

Before Operating Book of Book of

Year Depreciation Depreciation Income Value\* Return Value Return

1 100,000 40,000 60,000 100,000 60% 120,000 50%

2 100,000 40,000 60,000 60,000 100% 120,000 50%

3 100,000 40,000 60,000 20,000 300% 120,000 50%

\* ($120,000 + $80,000) ÷ 2; ($80,000 + $40,000) ÷ 2; ($40,000 + $0) ÷ 2

3. LaVilla might prefer the net book value because it always gives a higher ROI. However, she might prefer to be evaluated based on gross book value for two interrelated reasons. First, if she is being compared to other divisions, she knows that they will also report higher ROIs using net book value. Second, the benefit to her division of using net book value will occur mainly in the second and third years of the investment, after she transfers out.

10-34 (10 min.)

1. (b) (a)

Sell to Outsiders

Process Further at Transfer Point

Finishing Finishing

Division Overall Division Overall

Perfor- Perfor- Perfor- Perfor-

mance mance mance mance

Selling Price $83.00 $83.00 $---- $65.00

Variable costs:

Assembly Division $52.00 $52.00

Finishing Division 26.00 ----

Total variable costs 78.00 78.00 ---- 52.00

Contribution to

net income $ 5.00 $ 5.00 $---- $13.00

2. If the transfer price is based on variable cost of $52, the manager of the Finishing Division would want the product processed further. But this would hurt overall company performance. The incremental revenue from finishing the chair ($83–$65=$18) is less than the incremental cost of $26 incurred to finish the chair. Thus, finishing a chair decreases firm profit by $26-$18 = $8.

If the transfer price is instead based on outlay cost plus opportunity cost ($52 + $13 = $65), the manager of the finishing division will not want to process the product further, because the cost of the product ($65 + $26 = $91) will exceed the selling price of $83.

10-35 (10-15 min.)

1. If wheels were available for $14 each in the market, Dayton would not be willing to pay more than $14 to Toledo. If wheels could not be purchased in the market, the maximum price would be $20, computed as follows:

Sales price $170

Variable costs (except for wheels) 130

Contribution available for wheels and

to cover fixed costs and profit $ 40

The $40 must pay for two wheels, so the most that can be paid per wheel is $40÷2 = $20. The manager of the Dayton Division would likely not pay the entire amount of $20 per wheel, because that would leave no contribution to fixed costs plus profit. However, any price less that $20 would produce a positive contribution margin and therefore be better than not producing the bicycles.

2. Because there is excess capacity, any transfer price above the variable cost of $10 would result in a positive contribution margin. No price below $10 would be acceptable. If there were no excess capacity, the minimum transfer price would be the market price of $14. Why? Because the Toledo division would have to forgo $14 of revenue from an external sale in order to transfer a wheel internally.

10-36 (10 min.)

1. Princeton is better off using a £800 transfer price. A £800 transfer price places an extra £800 - £500 = £300 of income in Ireland instead of Japan, while a £500 transfer price places an extra £300 of income in Japan instead of Ireland. In addition, the £800 transfer price adds to the import taxes paid to Japan. The net effect is as follows:

Irish income is £300 higher, .24 × £300 more taxes £ (72)

Japanese income is £300 lower, .45 × £300 less taxes 135

Japanese import tax, .13 × £300 more taxes (39)

Net reduction in taxes from £800 transfer price £ 24

2. The total taxes saved by the £800 transfer price is £24 per unit.

10-37 (20-25 min.)

1. The two contracts illustrate the tradeoff between incentive and risk in employment contracts. The bonus contract provides more incentive to generate profits than does the straight salary. This should benefit Tamura International. On the other hand, it may cause the manager to focus too much on short-run profitability. Further, it imposes risk on the manager. A manager demands extra compensation to bear this risk. If the vice-president/personnel is correct, the expected cost to Tamura International of this risk is ¥90,000 (the amount by which the expected compensation with the bonus plan exceeds the straight salary). The choice should be based on whether the extra incentive under the bonus plan is likely to be worth at least ¥90,000 to Tamura International.

Another factor to consider is what type of manager will be attracted by each type of contract. Sometimes it is hard to determine a manager's qualifications at the time of hiring. The manager knows his or her abilities better than does the company. Highly qualified managers would seek contracts with a bonus. Why? They would be confident that they would do better than average and therefore receive compensation above what the firm expects an average manager to receive. The opposite is true for less qualified managers. Because Tamura International receives ¥9 of every ¥10 of extra profit generated, attracting a highly qualified manager is likely to be advantageous.

2. Managers are generally risk averse. This means that they prefer a contract with less risk to one with more risk if the expected compensation does not differ. It does not mean that managers avoid risks, only that they want to be compensated for such risk-seeking. If a risky contract has an expected compensation high enough, it will be preferred to a given risk-free contract. For Tamura International, a quality manager willing to accept a straight-salary contract at ¥400,000 might not accept a risky bonus contract with an expected compensation of ¥400,000. Extra compensation must be paid to offset the added risk.

The Tamura International Trading Company should recognize that besides normal operating risk, they have imposed an added risk in the bonus contract. Because the contract is in Japanese currency, possible movement in exchange rates adds to the noncontrollable factors affecting the bonus, hence it increases the risk if the manager is in Mexico City and wants to be paid in pesos.

10-38 (25 min.)

1. The two separate components highlight certain features of profitability that are not revealed by the single calculation.

a. The importance of capital turnover as a key to profits is stressed.

b. The importance of sales volume is explicitly recognized.

c. It reduces important elements to ratios instead of dollar figures. This often enhances comparability of different divisions, businesses, and time periods.

d. The breakdown stresses the possibility of trading off capital turnover for return on sales so as to increase the average rate of return at a given level of output.

e. It gives clues to the companies' strategies, such as their tradeoff between profit margins and sales volume.

2. Company

Adam Basil Collin

# Return on sales 9% 12% .6%

Turnover on capital × 2.7 × .125 × 2.4

Return on investment 23.9% 1.5% 1.5%

Income and investment alone shed little light on comparative performance because of disparities in size between Adam and the other two companies. The fact that Basil and Collin have identical income and capital suggests that the same conditions underlie the low rate of return, but this conclusion is erroneous.

Introducing sales to measure level of operations helps to disclose specific areas for more intensive investigation. Basil does better than Adam in terms of profit margin, 12% versus 9% return on sales. But Basil has a much lower turnover of capital than does Adam. Whereas a dollar of investment in Adam supports 2.7 dollars in sales each period, a dollar investment in Basil supports only 12.5 cents in sales each period. This suggests that the analyst should look carefully at Basil's investment. Is the company keeping an inventory larger than necessary for its sales volume? Are receivables being collected promptly? Or did Adam acquire its fixed assets at a price level that was much lower than that at which Basil purchased its plant?

On the other hand, Collin's capital turnover is closer to Adam's, but Collin's return on sales is much lower. Why? Are its operations inefficient, are its material costs too high, or does its location entail high transportation costs?

Analysis of return on capital raises questions such as the foregoing. When answers are obtained, basic reasons for differences between rates of return may be discovered. For example, in Basil's case, it is apparent that the emphasis will have to be on increasing capital turnover by reducing investment or increasing sales. Most likely, Basil cannot appreciably increase its rate of return on investment simply by increasing its return on sales. In contrast, Collin's management should concentrate on increasing the return on sales.

3. Basil has a high return on sales and a low capital turnover strategy and probably focuses on high-end merchandise. In contrast, Collin has a low return on sales and a high capital turnover. It might attempt to create high volume by offering low prices.

10-39 (15-20 min.)

1. (a) Entertainment $210 ÷ $1,050 = 20%

Publishing/Information 140 ÷ 700 = 20%

Consumer/Commercial Finance 265 ÷ 1,060 = 25%

(b) Entertainment $1,050 ÷ $1,000 = 1.05

Publishing/Information 700 ÷ 1,400 = .50

Consumer/Commercial Finance 1,060 ÷ 848 = 1.25

(c) Entertainment $210 ÷ $1,000 = 21%

Publishing/Information 140 ÷ 1,400 = 10%

Consumer/Commercial Finance 265 ÷ 848 = 31.25%

2. This requirement can lead to a lengthy discussion of what causes differences in the three measures computed in requirement 1. The obvious difference is the low return on investment in the Publishing/ Information segment. It is worth noting that this difference arises primarily because of the low capital turnover in the segment. The Publishing/Information segment is generating less than half as much sales revenue per dollar of invested capital as either of the other two segments.

10-40 (25 – 30 min.) Amounts in thousands.

Economic

Economic Value

Profit Added

Income from operations $ 267,400 $ 267,400

Net Adjustments to income for EVA 5,398

Provision for taxes (57,455)

Cash taxes (64,800)

Net Operating Profit After-tax (NOPAT) 209,945 207,998

Average total assets, (1,834,456 + 1,889,321) ÷ 2 1,861,889 1,861,889

Average current liabilities, (340,125 + 471,859) ÷ 2 405,992 405,992

Average capital for economic profit 1,455,897 1,455,897

Added capital from adjustments for EVA 234,159

Average capital for EVA 1,690,056

Cost-of-capital percentage ×11.3% ×11.3%

Capital charge 164,516 190,976

Economic profit or EVA $ 45,429 $ 17,022

10-41 (10-15 min.) Amounts are in millions.

1. Year 2 EVA = $4,463 - $3,569 - $292 - (11.5% × $2,854) = $274

Year 1 EVA = $4,510 - $3,615 - $255 - (11.5% × $2,689) = $331

2. EVA decreased from $331 million to $274 million. The decrease was caused by a decline in operating income and, despite the decline in pre-tax income, an increase in income taxes. However, both years showed positive EVA and therefore positive value creation.

10-42 (10-15 min.)

1. Weighted-average cost of capital:

55% × 10% = 5.50%

45% × 12% = 5.40%

10.90%

EVA = $8,210,000,000 - $1,395,000,000 – (10.9% × $27,555,000,000)

= $3,811,505,000

2. Holt’s EVA of $3.8 billion means that Holt generated $3.8 billion of value for its shareholders above the cost of capital, the weighted average of the normal return expected by Holt's investors. Note that this is an accounting measure of change in value, and it is not necessarily equivalent to the change in market value of Holt’s stock.

10-43 (20-30 min.) Dollar amounts are in thousands.

Tools Appliances Lighting

Historical Cost:

Average net assets $15,000 $44,000 $27,000

Operating income 2,600 6,750 5,000

Capital charge 1,500 4,400 2,700

Economic Profit 1,100 2,350 2,300

Rate of return on net assets 17.3% 15.3% 18.5%

Replacement Cost:

Average net assets $16,000 $55,000 $48,000

Operating income 2,500 6,150 3,900

Capital charge 1,600 5,500 4,800

Economic Profit 900 650 (900)

Rate of return on net assets 15.6% 11.2% 8.1%

Neither base is foolproof regarding the evaluation of an individual manager's performance. First, the short-run emphasis of such measures includes only a part of the activities that promote profitability in the long-run. Second, the environmental conditions facing a particular division plus unfavorable carryover of past mistakes may severely hamper divisional performance even though the manager is clearly superior by any test other than rate of return or economic profit. That is, the "best" managers are often deliberately given the sickest divisions precisely because they have the most ability to improve a bad situation. Improvement or fulfilling carefully budgeted targets may be the best tests of management performance as distinguished from divisional performance.

2. The following rankings exist:

Rate of Return Economic Profit

On On On On

Histor- Replace- Histor- Replace-

ical ment ical ment

Cost Cost Cost Cost

First Lighting Tools Appliances Tools

Second Tools Appliances Lighting Appliances

Third Appliances Lighting Tools Lighting

3. In this case, if historical cost is the base, the use of rate of return on net assets ranks Lighting first, whereas economic profit ranks Appliances first. Used indiscriminately, each method has its drawbacks, regardless of whether historical cost or replacement cost is used as a base. Rate of return inhibits divisions with high rates from expansion, whereas economic profit tends to favor large divisions as long as they earn in excess of the cost of capital.

Replacement costs are more helpful than historical costs as indicators of the relative profitability of divisions because they are usually good approximations of the current economic sacrifice being made to conduct such operations. As for managers, their ability to meet budgeted goals, however measured, is paramount. Students, professors, and managers have disagreements regarding which asset base is preferable.

10-44 (50-60 min.)

1. See Exhibit 10-44 on the following page.

2. Some major companies, including du Pont and Monsanto Chemical, have used gross assets as an investment base. One reason often cited for using undepreciated cost is that it partially compensates for the impact of the changing price level on historical cost. However, if a company desires to use replacement cost as a base, it should not try to tailor historical costs to the measurement problems of changing prices; the results of such hybrid attachments can be unreliable.

The reasoning in support of the gross assets base must be aligned with the purpose for its use: appraisal of company results as a whole (column 11 of the answer to requirement 1) or appraisal of a plant's or division's performance (column 6). A company's performance as a whole is the responsibility of top management. When profits are made, depreciation is recouped out of sales revenue. If dividends are paid in the amount of net income, cash may accumulate in the amount of the annual $130,000 depreciation (column 8). (No cash is kept in the business from earnings, but there is a conversion of fixed assets into cash as measured by depreciation.) To count original cost plus the cash accumulation as a part of the investment base (column 10) is duplication; it does not provide as useful a base as net assets. In contrast, a plant manager's or division manager's performance often is best analyzed by using gross assets as the investment base (column 6). The reinvestment of the cash accumulation in the amount of depreciation charges may be beyond the manager's control.

Those who favor gross asset value as a base state that it facilitates comparisons among plants or divisions. If income moves downward as a plant ages, the decrease in earning power will be evident under a gross asset base, while the constantly decreasing net asset base will reflect a possibly misleading higher rate of return in later years (column 7).

EXHIBIT 10-44

Rate of Return on Assets Using Original Cost of Fixed Assets vs. Using Net Book Value of Fixed Assets

Plant Performance Company Performance

Fixed Assets Rate of Return

Accumu- Net Average On Total Gross Assets Net Assets

lated Value, Book Annual On Average Cash Average\*\*\*

Gross Depreci- End Value Net Gross Book Accumu- Cash Rate of Rate of

Year Cost ation of Year for Year\* Income Cost Value lation\*\* for Year Base Return Base Return

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13)

1 $520,000 $130,000 $390,000 $455,000 $20,000 3.8% 4.4% $130,000 $ 65,000 $ 585,000 3.4% $520,000 3.8%

2 520,000 260,000 260,000 325,000 20,000 3.8% 6.2% 260,000 195,000 715,000 2.8% 520,000 3.8%

3 520,000 390,000 130,000 195,000 20,000 3.8% 10.3% 390,000 325,000 845,000 2.4% 520,000 3.8%

4 520,000 520,000 0 65,000 20,000 3.8% 30.8% 520,000 455,000 975,000 2.1% 520,000 3.8%

\* ½ × (Beginning balance plus Ending balance), e.g., ½ × ($390,000 + $260,000) = $325,000 for year 2.

\*\* Assume that sales and expenses except depreciation are on a cash basis, and that dividends equal net income. Thus cash in the amount of the depreciation charge will accumulate each year.

\*\*\* This situation is unrealistic in the sense that idle cash is being accumulated without being reinvested to earn a return.

The proponents of using net book value as a base maintain that it is less confusing because (a) it is consistent with the total assets shown on the conventional balance sheet and (b) it is consistent with net income computations, which include deductions for depreciation. Using net book value prevents duplication of the same asset in the base and shows a constantly rising rate of return on plant performance. See column 7. Note that the inclusion of the cash accumulation and gross fixed assets duplicates the same item, so that the total fixed and current gross asset base rises from year to year.

The definition of income should be consistent with the definition of the capital base to which it is related. Thus, interest expense is ordinarily excluded in computing incomes that are related to asset bases, while interest expense is deducted in computing income that is related to stockholders' equity bases. Nonrecurring items are ordinarily excluded when current operating performance is to be appraised.

10-45 (30-40 min.)

The issues in this problem are covered briefly in a section in the chapter. This problem was originally used on a final examination. In particular, note that the quotation is dealing with how to evaluate performance, as distinguished from decisions to buy, hold, or sell assets.

A basic question, then, is why we bother to evaluate performance. Fundamentally, it is to assist future decisions and to provide managers with incentives toward organizational goals. One set of numbers may be appropriate for evaluating the economic performance of a segment, whereas a different set may be appropriate for appraising an individual manager's performance. The last sentence in the problem clearly recognizes this distinction, but students tend to pay insufficient attention to it in their solutions. Of course, the major reason for the distinction is that events uncontrollable by the manager sometimes dominate the economic performance of an entity; simultaneously, the manager may be doing either a superhuman or an abysmal job with respect to the critical factors under his or her control.

The issues presented in the statement assume the following logical pattern:

1. Economic values are the best for performance measurement.

2. Replacement values will probably be less than economic value throughout an asset's life.

3. Market (exit) value is inherently less than or equal to (usually the former) economic value for a given asset.

4. Use of economic value is infeasible; hence, replacement value should be used.

5. Replacement value will facilitate the evaluation of the division's performance more easily than the division manager's performance.

The statement correctly establishes economic value as the "ideal" measure of an asset's value. The statement fails to disclose the characteristics of economic value that make it "infeasible." Infeasibility probably refers to the difficulty of determining (a) cash flows in the future and (b) the appropriate discount rate to be applied to those flows in the present value process.

The statement presents a reasonable case in favor of replacement value over exit value.

Some remarks might be made about the fact that replacement costs of highly specialized assets may be more difficult to obtain than a direct approximation of their economic values via discounted cash flow techniques.

The biggest defect of the commentary is its failure to mention the cost and value of information tradeoffs in deciding whether some "current" value basis for evaluation of performance is superior to continuing to use historical cost.

10-46 (20-30 min.)

The rule to be used is that goods and services should be transferred at a price equivalent to that prevailing in an outside market at the time of transfer. Where the internal division meets these selling prices, the buying division must purchase internally. Market prices establish the ceiling for transfer-pricing. In many instances, a lower price may easily be justified, particularly where high-volume purchases are made or where selling costs are less.

In the two cases cited, the transfer prices should be no higher than those that could be obtained consistently by buying the used cars, parts, or services from outside parties.

The whole idea of decentralization is the manager's independence; unless a manager can resort to buying and selling outside the company, his or her profit center is essentially in a centralized company. Nevertheless, profit centers may promote more goal congruence than cost centers.

10-47 (30 min.)

1. Both the shocks and struts division and the company as a whole will benefit if the $42.70 price is met. If the shocks and struts division does not sell to the automotive division, 70% of the strut assembly volume will disappear, and gross margin will fall to $2,550,000 as follows:

Sales, 300,000 at $61 $18,300,000

Variable costs, at $38.50 $11,550,000

Fixed costs 4,200,000

Total costs 15,750,000

Gross margin $ 2,550,000

If the $42.70 price is met, the shocks and struts division will show a gross margin of $5,490,000 as follows:

## To

Automotive To

Division Outsiders Total

Sales:

700,000 at $42.70 $29,890,000

300,000 at $61 $18,300,000 $48,190,000

Variable costs 26,950,000 11,550,000 38,500,000

Contribution margin $ 2,940,000 $ 6,750,000 $ 9,690,000

Fixed costs 4,200,000

Gross margin $ 5,490,000

The rejection of intracompany business will reduce margins by $5,490,000 - $2,550,000 = $2,940,000. An alternative way to arrive at the same conclusion is to note that the acceptance of intracompany business will add a contribution margin of $4.20 per strut assembly ($42.70 less $38.50 variable costs) or $4.20 × 700,000 = $2,940,000 that will be forgone if intracompany business is rejected.

1. Yes, the division should reject intracompany sales and concentrate on outside sales since the gross margin would be $8,300,000, whereas the gross margin if automotive division business were accepted would be $5,490,000. The gross margin would increase by $2,810,000 as follows:

## Sales, 1,000,000 at $58 $58,000,000

## Variable costs, at $43 $43,000,000

Fixed costs 6,700,000

Total costs 49,700,000

## Gross margin (new proposal) $ 8,300,000

Gross margin (accepting intracompany

business) 5,490,000

Difference $ 2,810,000

10-48 (30 min.)

1. The U.S. Division should not supply the Australian Division with the sound system for the $7.00 per unit price. The U.S. Division is operating at capacity and would lose $4.00 ($11.00 - $7.00) for each part sold to the Australian Division. The management performance of the U.S. Division is measured by return on investment and dollar profits; selling to the Australian Division at $7.00 per unit would adversely affect those performance measures.

2. Samtech Electronics would be $5.40 better off in the short run if the U.S. Division supplied the Australian Division the part for $7.00 and the Game Box was sold for $62.00. Assuming that the $10.00 per unit for fixed overhead and administration is an allocation of costs the Australian Division incurs regardless of the Game Box order, Samtech would lose $4.00 in cash flow for each sound system sold to the Australian Division but gain at least $9.40 from each Game Box the Australian Division sells, a net gain of $9.40 - $4.00 = $5.40.

3. In the short run there is an advantage to Samtech Electronics of transferring the sound system at the $7.00 price and thus selling the Game Box for at least $62.00. To make this happen, Samtech Electronics could overrule the decision of the U.S. Division management. This action would be counter to the purposes of decentralized decision-making. If such action were necessary on a regular basis the decentralized decision-making inherent in the divisionalized organization would be a sham.

Alternatively, the problem could be placed back with the Australian Division. Even if the Australian Division had to pay the market price of $11.00, the contract would increase its profit. The variable cost would be $28.10 + $11.00 + $17.50 = $56.60. As long as the Australian Division has excess capacity, its profit would increase by at least $5.40 (i.e., $62.00 - $56.60) per Game Box. Therefore, both the Australian division and Samtech Electronics as a whole would be better off if the transfer were made at market price. It is up to the Australian Division managers to find a way to price the Game Box at $56.60 or more even when the sound system is transferred at $11.00.

10-49 (20-25 min.)

1. The Eugene Division manager would not buy the lumber for $70 and would not produce the chairs. The division would lose $4 on each chair produced at that price:

Revenue per chair $95

Division cost per chair:

Lumber $70

Manufacturing 23

Selling 6 99

Division loss per chair $ (4)

However, the company as a whole would benefit by $18 per chair if the chairs were produced and sold:

Revenue per chair $95

Additional costs per chair:

Lumber $48

Manufacturing 23

Selling 6 77

Total contribution per chair $18

Therefore, the policy to transfer at fully allocated costs motivates the manager to make a decision not in the best interests of the company as a whole.

2. When there is no idle capacity at the Shasta Mill, transferring lumber to the Eugene Division causes the Mill to pass up sales to outside customers. Compare the total contribution from selling the lumber to the total contribution from using the lumber to build chairs and selling the chairs:

Sell Lumber to Outside Customers

Revenue $72

Total additional costs:

Variable cost of lumber 48

Total contribution margin $24

Build and Sell Chair

Revenue $95

Total additional costs:

Variable cost of lumber $48

Manufacturing 23

Selling 6 77

Total contribution margin $18

The company is $6 better off with the contribution of $24 from selling lumber rather than $18 from selling the chair.

Another way to view this problem is that, if the lumber can be sold for $72, using it to build a chair adds $95 - $72 = $23 of additional revenue. The additional costs are $23 + $6 = $29. The company is $6 worse off if it spends $29 to gain $23 in revenue.

10-50 (25-30 min.)

1. Cost to San Jose division of using ArnoPrint:

($.20 × 180 pages) + (250 copies per page × $.02 × 180 pages)

= $36.00 + $900.00 = $936.00

Thus, Jiffy Press, at a bid price of $918.25, is the least expensive. In addition, the reports would be ready sooner. If the San Jose office is not directed by top management to do otherwise, it would choose Jiffy Press. If ArnoPrint would use otherwise idle capacity, Arno Legal Services would have variable cost of .50 × $936 = $468, which is less than the amount the San Jose division would pay to Jiffy Press. Thus, giving the business to Jiffy Press is not an optimal economic decision from the entire corporation's point of view.

2. If ArnoPrint has idle capacity, the minimum transfer price is its variable costs, .50 × $936 = $468. If ArnoPrint can get other orders outside at $936, the minimum transfer price should be $936. The best outside bid, $918.25, generally provides an appropriate transfer price.

3. The optimal decision might be to go with Jiffy Press since one to two days may be saved in getting the reports to the client. Potential future earnings for consulting services could be greater than the contribution forgone. However, it is uncertain whether the delay would affect the client’s decision to utilize Arno Legal Services in the future. The client's goodwill towards Arno Legal Services is also determined by factors such as the competence of the individuals in Arno Legal, the quality of the report, the price of the report, and the time required to prepare the report for printing.

4. Top management has decreased the sense of autonomy of its San Jose office in suggesting that ArnoPrint be utilized. This could affect morale and cause dysfunctional behavior, particularly since ArnoPrint’s quality is poor.

10-51 (10 - 15 min.)

The minimum transfer price is $23. Any price below $23 would cause the Fabricating Division to lose profit. In fact, the minimum transfer price could be slightly above $23 if the Fabricating Division, despite its current situation with excess capacity, would limit its future flexibility by agreeing to the production and transfer.

The maximum price is $39, the price at which the Lighting Division could buy the lamp shade on the market. It might be slightly less than $39 if the Lighting Division can save some transportation or handling costs by buying internally, or if it can be more confident in the quality when purchasing internally.

10-52 (15 min.)

This simple example provides a good opportunity to discuss the issue of moving profits from one division to another through transfer prices. The setting is different from any presented in the chapter.

Michelin certainly has an incentive to transfer tires at as low price as possible. A €1 larger transfer price shifts €1 of profit from Michelin’s parent-company account to its subsidiary’s account. Michelin retains 100% of its parent-company profits, but it gets only 70% of the subsidiary’s profits. Thus, for every €1 addition to the transfer price, Michelin Group loses €1 and gains only €.70, a net loss of €.30.

Of course, the minority shareholders of Stomil Olsztyn want as much profit as possible transferred to their company. Thus, they favor a high transfer price. Each extra €1 of transfer price gains them €.30 in profit. Suppose Stomil Olsztyn could sell the tires on the market and receive a contribution of €9 rather than the contribution of €5 they get from Michelin. Then, the minority shareholders would gain 30% × €4 = €1.20 per tire.

A key to a fair transfer price is Stomil Olsztyn’s alternative opportunities. If the subsidiary could sell the same tire on the market for a net price (market price less discounts less costs incurred to sell on the market that the subsidiary does not incur on sales to Michelin) of more than €25, the transfer price is too low. Or, if it uses resources that could make alternative products that would have a contribution margin greater than €5, the price is too low. In such cases, Michelin is gaining at the expense of the minority shareholders of Stomil Olsztyn.

Arms-length negotiation between managers of Michelin and Stomil Olsztyn may lead to optimal transfer prices, provided that both seek to maximize their own unit’s profits.

10-53 (15 min.)

1. The optimal transfer price is $350 per unit:

(a) Tax savings with $350 transfer price:

[.65 × ($350-$200)] – [.30 × ($350 - $200)]

= $97.50 - $45 = $52.50

(b) Additional duty with $350 transfer price:

.05 × ($350-$200) = $7.50

(c) Advantage of $350 transfer price over $200 transfer price:

$52.50 - $7.50 = $45

2. With these changes, the $200 transfer price is optimal:

(a) Tax savings with $350 transfer price:

[.40 ($350 - $200)] – [.30 ($350-$200)]

= $60 - $45 = $15

(b) Additional duty with $350 transfer price:

.15 ($350-$200) = $22.50

(c) A $350 transfer price generates $22.50 extra duty and saves only $15 in taxes. Therefore, the $200 transfer price is best.

Multinational transfer pricing is heavily affected by the constraints of various countries' laws on taxes and tariffs. Moreover, the resulting transfer prices complicate the evaluation of the performance of the managers and the economic investments in a particular country.

10-54 (15-20 min.)

1. 1,500 units × ($37 - $21) = $24,000 increase in operating income if units are purchased inside.

2. Variable manufacturing costs of $21 per unit.

3. Currently available outside purchase price of $37 per unit.

4. (a) Benefit of $24,000 from the Montreal Division’s viewpoint, but disadvantage of 1,500 units × ($40 - $21) = $28,500 from the Toronto Division viewpoint. Therefore, net decrease in Canadian Instruments Company’s operating income of $4,500.

(b) Benefit of zero to the Montreal Division, but disadvantage of ($40 - $37) (1,500) = $4,500 to the Toronto Division. Net decrease in Canadian Instruments Company’s operating income of $4,500.

5. (a) Toronto Division's current ROI = $36,000 ÷ $300,000 = 12%. Proposed investment earns an ROI = $2,000 ÷ $20,000 = 10%. Therefore, the Toronto Division's ROI will decrease if the proposal is accepted.

(b) $2,000 - .07($20,000) = $600 increase in the Toronto Division economic profit, so the Toronto Division would accept proposal.

10-55 (25-35 min.)

In a short space, this case gets to the heart of the problems of a control system: goal congruence and effort. In particular, it focuses on how the widespread accounting convention of writing off engineering costs as immediate expenses may inhibit wise investments. It is also a good problem on the motivational impact of cost allocations, so it might be assigned in conjunction with Chapter 12.

1. The strong points of the present plan include the tendency of the PED manager to hire the optimal number of engineers and to use them efficiently. At first glance, the production managers will also tend to behave in similar fashion. In addition, the user receives no surprises because the total cost of each "contract" is known in advance.

The weakest point of the present plan is not explicitly pinpointed in the case. (We usually do not raise this point until the proposed plan is discussed.) Why is top management considering a switch to a "no-charge" system? To encourage greater use of PED services! Such services are evidently being under-used. A likely reason for small usage is that the "expense" borne in the first year may exceed the prospective savings for the first year. Therefore, even if the investment is justified on a longer-run basis, the production managers feel too much pressure for short-run performance to look beyond the current year. (Moreover, many managers are transferred or promoted nearly every year.)

Under the proposed plan, the PED manager may continue to hire engineers until their marginal cost exceeds the marginal savings. But a tenser atmosphere is likely. PED services would be a "free good." When the selling price is zero, the production managers will increase their demand. The PED manager (or some committee) will have to determine priorities. In contrast, the present plan uses a "market price" system of sorts. Priorities are determined by a negotiated contract at a predetermined price.

2. Most students will favor the present system, although a minority may like the proposed system. Of course, other systems are possible. For example, an internal accounting system could capitalize the PED costs and amortize them over the "useful life" of the expected cost savings. The latter system would then provide a method of performance evaluation (incentive) that would be consistent with the decision model (long-run net savings) apparently favored by top management.

Again, in the final analysis, the choice of a system will depend on top management's prediction of the impact of the particular method on the collective decisions of the affected managers. In this instance, incidentally, top management adopted the proposed plan.

A major lesson here is that internal accounting systems are neither inherently good nor inherently bad. The role of timing and the wishes of top management dramatically affect the choice of a system. Thus, a particular system may solve the problems of goal congruence and effort for a year or two or more. However, as time passes, the system invariably warrants correction or revamping.

For example, after a class discussion of this case in an executive program, a French executive said in effect:

"This case is one that I've experienced. A few years ago, our top management adopted the no-charge system to spur heavier use of our central research and development department. Five years later we returned to a charge system, because our central staff had ballooned to an intolerable level."

In both instances, the choice of the system could have been correct.

Finally, the literature on agency theory emphasizes risk congruence. That is, incentives may be designed to encourage or discourage risk-taking. The existing system discourages risk-taking on the part of individual managers because they have less chance to have a diversified portfolio of projects. The proposed system shifts the risk to the PED manager. Because this manager can attain a diversified portfolio, he may accept more risky projects. Top management may prefer the latter.

10-56 (20-30 min.)

1. Management by Objectives (MBO) is a formal system for developing and making measurable the goals for each position in the organization for a given time period. Mutually agreed upon goals are set for each subordinate with his or her superior. Both agree on the objectives to be met and how they will be measured.

Advantages most often claimed for the MBO system include:

1. Increased subordinate motivation to accomplish goals.

2. Channeling of subordinate efforts toward organizationally recognized goals rather than individual goals.

3. Increased development of subordinate abilities through the systematic establishment of goals by subordinates.

4. Improved performance appraisal accuracy over time because substantive measures are used rather than subjective supervisor evaluation.

5. Increased communication between subordinate and superior.

Disadvantages associated with MBO include:

1. Likely emphasis on short-run rather than long-run consequences.

2. Difficulty in dealing with non-quantifiable factors.

3. Emphasis on organizational rather than personal goals, needs, and wants.

4. The increased emphasis on counseling often requires too much time.

5. Limited effectiveness in turbulent or less-structured environments.

2. The human value premises of MBO suggest that subordinates will attempt 100% achievement if they accept a clear and tangible set of objectives. Inherent in MBO is the premise that goal formation is a joint process, where individual subordinates are involved in setting goals for their activities and developing programs that lead to attainment of organizational goals. In addition, the MBO system allows for adjustments to be made in goals to account for errors that may have occurred during the formation of them. During the appraisal process of MBO, recognition should be given for partial achievement of goals as well as for reaching the various goals.

Roger Ravenhill does not incorporate the human value premises of MBO in his management style for the following reasons:

1. Goal setting at Haida Company is not a joint process. Ravenhill assumes that only he can establish organizational and individual goals. Subordinates apparently are not consulted.

2. Ravenhill has assumed that no errors have been made in assigning objectives.

3. Apparently no analysis was conducted to determine the cause for any lack of achievement.

4. It is likely that Ravenhill failed to use periodic review sessions to help subordinates find ways to meet their goals.

10-57 (25-30 min.) All amounts in this solution (except percentages) are in millions of dollars.

ROA (based on segment EBIT and assets)

Segment 2011 2010

North America 1,750 ÷ 2,433 = 71.9% 1,538 ÷ 1,941 = 79.2%

Western Europe 721 ÷ 1,272 = 56.7 856 ÷ 1,031 = 83.0

Central & Eastern Europe 233 ÷ 448 = 52.0 253 ÷ 384 = 65.9

Greater China 777 ÷ 471 = 165.0 637 ÷ 379 = 168.1

Japan 114 ÷ 595 = 19.2 180 ÷ 568 = 31.7

Emerging Markets 688 ÷ 953 = 72.2 521 ÷ 683 = 76.3

Economic Profit (based on segment EBIT and assets)

Segment 2011 2010

North America 1,750 – (.1 × 2,433) = $1,506.7 1,538 – (.1 × 1,941) = $1,343.9

Western Europe 721 – (.1 × 1,272) = $593.8 856 – (.1×1,031) = $ 752.9

Central & Eastern Europe 233 – (.1 × 448) = $188.2 253 – (.1 × 384) = $ 214.6

Greater China 777 – (.1 × 471) = $729.9 637 – (.1 × 379) = $ 599.1

Japan 114 – (.1 × 595) = $54.5 180 – (.1 × 568) = $ 123.2

Emerging Markets 688 – (.1 × 953 ) = $592.7 521 – (.1 × 683) = $ 452.7

The North America segment produced the most economic profit both years, and Greater China had the highest ROI in both years. The Japan segment had the lowest ROI both years and the lowest economic profit both years.

In 2011 the ROI decreased for every segment. The largest decrease was for Western Europe. Economic profit increased for three segments and decreased in three, where the increases were in North America, Emerging Markets, and Greater China.

To assess a manager’s performance, all of these performance metrics must be examined relative to the economic situation in the segment’s part of the world. If the economy in a segment’s part of the world is not doing well, the manager that just maintains ROI and economic profit levels might be performing very well. Performance metrics should also be examined in light of the actions of competitors. Sometimes it is important to sacrifice short term return to maintain market position relative to a major competitor. It is hard to determine which manager is performing best simply from the data given. It is tempting to say that the manager of the Japan segment is performing worst since the segment had the lowest ROI or and the lowest economic profit. However, the competitive situation may be quite different for these segments. And at least the economic profit is positive for all segments (indicating that the segments are generating more than the cost of capital).

10-58 (25-30 min.) For the solution to this Excel Application Exercise, follow the step-by-step instructions provided in the textbook chapter.

1. Duane has the best performance using ROI, while Louis has the highest economic profit.

2. Hubert has both the lowest ROI and the lowest economic profit.

3. The method chosen will affect the decisions of the managers. The manager of Duane, the one with the largest ROI, would reject proposed investments returning between 10% and 14% even though such projects would be profitable for the company as a whole. Why? Because they would reduce the Duane division’s ROI. In contrast, under economic profit, every division would accept investment proposals if and only if they returned more than 10%. Thus, economic profit motivates managers to make decisions that are more congruent with management’s objectives.

10-59 (40 min. or more)

The purpose of this exercise is to recognize that return on investment, a summary performance measure, is composed of two parts that may differ greatly by company and by industry. It also requires students to find publicly available information about a company, possibly using the Internet to do so.

Requirement 1 is an individual exercise in information gathering and analysis. Requirement 2 brings in the group aspect. By comparing results across companies, students should be able to see that some businesses generate returns on their investment through large margins (e.g., computer software companies), while some have high capital turnover (e.g. grocery stores). Strategies to improve ROI can emphasize either increasing margins or turnover.

If class time permits, reports from the groups would be worthwhile. In as little as 10 minutes of class time, students can see the variety in margins and turnover. They can also be reminded that the ultimate objective is return of investment, so focus on either margins or turnover without at least maintaining the other is not productive.

10-60 (40-50 min.) NOTE TO INSTRUCTOR: This solution is based on the web site as it was in late-2012. Be sure to examine the current web site before assigning this problem, as the information there may have changed.

1. The main focus is on being able to locate a Marriott hotel in a particular city, state, or country and make a reservation. The emphasis is on promotion, with less emphasis as a portal to corporate information about Marriott.
2. Each of Marriott’s brands appears to operate at least somewhat independently. They are good candidates for treatment as investment centers. Why? Each brand probably has some degree of control over its investment decisions. If not investment centers, the segments are likely to be profit centers.
3. In the 2011 annual report, footnote 16 reported information on four segments, North American Full-service Lodging, North American Limited-service Lodging, International Lodging, and Luxury Lodging. In previous years, there had been another segment, Timeshare, which has now been spun off (see footnote 17 of the 2011 annual report). Information reported for each segment includes Revenues, Income, Noncontrolling interest (shown only for 2009 when Marriott still had a timeshare segment with noncontrolling interests), Equity in earnings (losses) of equity method investees, Depreciation and amortization, Assets, Equity method investments, Goodwill, and Capital expenditures.
4. Using average balances for assets, the ROA calculations are:

NA Full-service $351 ÷ $1,231 = 28.5%

NA Limited-service $382 ÷ $481 = 79.4%

International $175 ÷ $924 = 18.9%

Luxury $74 ÷ $901 = 8.2%

1. Using average balances for assets and income (which both include amounts not allocated to segments), the ROA for the corporation as a whole was $198 ÷ $7,447 = 2.7%. The ROA for the corporation is substantially lower than the ROA for any of the segments because there are substantial costs not allocated to the segments in determining segment income.   
   In determining whether to use return on assets as a measure of how well a segment performed, you would want to consider several factors. For example: Does each of the segments have autonomy to operate independent of central management? Do segment managers have control over sales and investments in assets? The answers to these questions help determine the appropriate type of performance measures to use.
2. Marriott primarily provides lodging services. If one segment provides lodging to employees of another segment, transfer prices are necessary. However, this is unlikely to comprise a large percentage of the business of any of the segments. Nevertheless, the company may have a policy such as charging a low transfer price if a hotel has excess capacity but charging the rack rate if a particular hotel is full.

Marriott may also transfer services (cleaning, repairing, etc.) between different brands of hotels. For example, Marriott may have full-service hotels and limited-service hotels in the same area that use services available from one another.

The transfer prices for these exchanges would likely be set somewhere between variable cost and market values.