

9. (Pg. 893) b	A sales	\$ 1,700
	A costs	
	Before	\$1,500
	After	100
	Advantage	\$ 100
	B sales	\$ 1,900
	B costs	
	Before	\$1,500
	After	200
	Advantage	\$ 200

10. (Pg. 886) d

Demonstration Problems

1.	Make	Buy	Difference
Incremental x Volume		\$15.00 15,000	\$1.00 15,000
Total VC		225,000	\$15,000
Less: A		22,500*	22,500
Total cost		202,500	(\$ 7,500)
*Total a			nents = \$45,000 x 50%
The cost buy it purchase			),000, and the cost to component should be nts are needed.

Chapter 20
next Page

2.		Product B:
CMU	\$12	\$14
÷ Std. Mach.-Hrs.	3	4
CMU per Std. Hr.	\$ 4	\$3.50

The most profitable product is A and should be manufactured instead of B.

CHAPTER 20

SEGMENTING THE ENTERPRISE FOR PROFIT PERFORMANCE EVALUATION

CHAPTER OVERVIEW

Chapter 20 will discuss the fact that, as enterprises grow and activities become more complex, some division of responsibility will become necessary. You will examine responsibility centers and a responsibility accounting system. You will also learn how to segment a profit center's income statement for segment and manager performance evaluation. You will learn how to analyze factors in an add-or-drop decision, using both product life cycle analysis and the growth/share matrix. You will learn how to evaluate investment center profitability and, finally, will look at the Kyocera amoeba system.

Review of Specific Chapter Objectives

1. Examine responsibility centers and state their purpose (pgs. 932 - 938).

- ▲ A responsibility center (RC) is a segment of the organization in which a manager is held accountable for a specified set of activities and financial factors, including investment, revenue, and cost decisions. Decision making is diffused among a number of managers who have the authority to make certain major decisions without clearing them through central headquarters.
- ▲ An enterprise generally first divides responsibility by activities, such as business functions (finance, engineering, production, marketing, logistics), product lines or services, or geographic regions.
- ▲ Advantages of decentralized responsibility centers include:
 1. Focused decision making
 2. Closeness to the action
 3. Timely decision making
 4. Training ground for managers
 5. Engenderment of motivation
 6. Enhancement of strategic planning
 7. Ease of evaluating managers' performance
- ▲ Disadvantages of decentralized responsibility centers include:
 1. Lack of goal congruency
 2. Duplication of activities
 3. Difficulty in comparing performances
- ▲ With decentralization, maximizing employee empowerment and goal congruence become primary goals. An ICBIS is needed to link responsibility centers and their LANs. A modern trend is the move to client/server networked microcomputers. Benefits include:
 1. Increased user performance at less cost
 2. User-friendly interfaces, such as graphical

displays, no matter where the users are accessing the system

3. Ability to distribute centralized information throughout the enterprise
4. Increased decision-making flexibility at the local level

▲ For many applications, the mainframe is still the only workable technology platform. It is critical to decide which applications should be run on a mainframe and which should be run on a smaller computer. The following considerations are important:

1. The size of the application
2. The kind of application planned for the system
3. The number of end users

2. Relate responsibility centers and responsibility accounting system design to profit performance evaluation (pgs. 938 - 944).

▲ Responsibility center managers might have responsibility for one or more of the following three financial factors: cost, profit, and investment.

▲ A cost center is any RC where the manager can exert influence over cost but has little, if any, authority to influence revenues or investments in fixed assets. Examples are production departments and maintenance departments. A cost center can produce a product or render a service. In addition to traditional cost variance reports (sole reliance on which is the target of criticism), the responsibility accounting system should supply cost center managers with nonfinancial information needed for continuous improvement.

▲ A profit center is any RC where the manager has the authority and responsibility to make decisions that will affect the costs and revenues of that center but has little decision-making power over investments in fixed assets. Segmented income statements are used for proper performance evaluation.

▲ An investment center is any RC where the manager has the authority and responsibility to make decisions that will affect the costs, revenues, and investments of that center. Two popular performance measurements are return on investment (ROI) and residual income (RI).

▲ An objective of responsibility accounting is to tailor performance reports to their appropriate levels. Activities and financial factors deemed to be uncontrollable for a particular manager should be excluded when evaluating this person's performance. Successful operation of a responsibility accounting system rests on two assumptions: Spending is subject to control; and responsibility for spending can be directly traced to a specific manager.

- ▲ Spending controllability, however, is a matter of degree driven by level of authority and time. All spending is controllable at some level of authority at some point in time.
- ▲ All RCs require the following:
 1. Clear-cut lines of responsibility must be drawn.
 2. Responsibility must be coupled with commensurate authority.
- 3. Segment the profit center's income statement for segment and manager performance evaluation (pgs. 944 - 953).
 - ▲ The management accountant has two basic goals in evaluating a profit center's financial performance:
 1. To report on the profitability of the segment
 2. To report on the performance of the segment manager.
 - ▲ For financial reporting, the income statement organizes costs by their functions; this format uses absorption costing in that fixed overhead is absorbed into the product cost. When segmenting the income statement using the absorption costing principle, indirect costs (common fixed costs across all profit centers) are allocated to the profit centers. If a contribution margin-based approach is used, the common fixed costs are reported separately just in the totals column. This method organizes costs by behavior and separates the common fixed costs from the direct fixed costs of the segments.
 - ▲ The direct profit generated by each product line is measured in its segment margin, calculated by subtracting the direct fixed costs of a segment from its contribution margin. Product lines can be subsegmented into geographic territories.
 - ▲ In evaluating a profit center manager's performance, it is necessary to consider controllable segment margin, calculated by subtracting controllable direct fixed costs from contribution margin. It includes only those activities for which the manager has decision-making responsibilities.
 - ▲ Profit variances are the difference between the master budget pro forma income statement and the actual segmented income statement. They are comprised of:
 1. Sales variances, which include sales price variance and sales volume variance.
 2. Cost variances, which include variable and fixed spending variances for selling and administrative expenses, and variable and fixed spending and usage variances for production costs.
 - ▲ A flexible budget is a budget created at the end of the period using the actual volume. It provides standards to use in evaluating actual results.

- ▲ Sales volume variance = Budgeted contribution margin per unit x (Actual sales volume - Sales forecast)
 - ▲ Sales price variance = Actual sales volume x (Actual sales price - Budgeted sales price)
 - ▲ FOH volume variance = FOH standard cost x (Actual volume - Budgeted volume)
 - ▲ Other fixed costs volume variance = Other fixed standard costs x (Actual volume - Budgeted volume)
4. Identify the relevant profit elements for the add-or-drop decision, and describe how product life cycle analysis and the growth/share matrix are used (pgs. 953 - 958).
- ▲ The add-or-drop decision deals with whether to add, drop, or continue a particular product, line of products, enterprise segment, or service. Both qualitative and quantitative factors must be considered.
 - ▲ Qualitative factors include an enterprise's belief that it is obligated to carry a range of sizes, colors, styles, flavors, or related items.
 - ▲ With respect to quantitative factors, only the fixed costs that can be avoided by dropping the item are subtracted from that item's contribution margin. If the result is positive, then the item should be kept (or added) because this amount increases the profits of the enterprise. All or part of direct fixed costs may be sunk costs.
 - ▲ Two supplementary methods that can help in making the add-or-drop decision are product life cycle analysis and growth/share matrix.
 - ▲ Product life cycle analysis is a useful aid to managers who must determine how to allocate scarce resources to products or product lines in a manner that will maximize enterprise profitability. The product life cycle graph shows sales volume and net profit at various stages (introduction, growth, maturity, and decline) of the product's life.
 - ▲ The growth/share matrix is a graphical presentation of the types of products within a segment in terms of their cash flow-generating capabilities. The following are the types of products:
 1. Cash cows, which provide the main source of cash and earnings to the enterprise and which have high market share but a low growth rate.
 2. Stars, which have a high growth rate and are the future of the company. As growth slows, stars become cash cows.
 3. Problem children, which generate little cash and have low market share. They require large amounts of cash to support their high growth rate.

4. Dogs, which neither generate nor require much cash and which are usually dropped because of their low market share and low growth rate.
5. Calculate profit performance measures for investment center managers (pgs. 958 - 966).

▲ Investment center managers are also responsible for profit management. Segmented income statements are used for evaluation, as are two commonly used financial measures of asset profitability: return on investment (ROI) and residual income (RI).

▲ Return on investment, or return on assets, is the ratio of earnings produced by an investment center to the investment in that center. It is calculated by dividing the center's earnings (net operating income) by its average investment in assets.

$$\text{ROI} = \frac{\text{Investment center net income}}{\text{Investment center assets}}$$

▲ The ROI ratio can be broken down into its two component ratios: profit margin and asset turnover.

$$\text{ROI} = \frac{\text{Profit margin}}{\text{Inv. ctr. net income} / \text{Inv. ctr. sales}} \times \frac{\text{Asset turnover}}{\text{Inv. ctr. sales} / \text{Inv. ctr. assets}}$$

Each component ratio provides important information. Profit margin focuses on the rate of earnings generated by each sales dollar. Asset turnover focuses on the use of assets and indicates the rate at which sales are being generated for each dollar invested. Decomposition shows that investment center managers can improve their ROI by increasing sales, by reducing costs, or by reducing assets.

▲ Net income should include only the revenues and costs over which the manager has control. The asset base should include those asset and liability accounts over which the manager has control and responsibility. Three common choices for valuing assets in the base are gross book value, net book value, and current value.

▲ ROI should be used in conjunction with other financial and nonfinancial performance measurements in evaluation of investment centers. Used alone, it can produce distorted information, such as the following:

1. Managers who retain older, mostly depreciated assets report much higher ROIs than managers who invest in new assets.
2. ROI-based measurements enable executives to generate greater profits from financial activities than from better managing their assets.

3. ROI-based measurements give managers incentives to reduce expenditures on intangible investment, such as research and development.

▲ Residual income (RI) is the net operating income that an investment center earns above some minimum rate of return on assets.

$$RI = \text{Net operating income} - (\text{Asset base} \times \text{Minimum rate of return})$$

The major advantage of RI as a performance measurement is that it gives consideration not only to a minimum rate of return on investment in assets, but also to the absolute size of the earnings generated by each division.

6. Discuss Kyocera's amoeba system and new organizational structures in American firms (pgs. 966 - 969).

▲ The amoeba system is a responsibility system in which segments of an enterprise are divided into organic, flexible units that have full cost and profit responsibilities. Kyocera Corporation's smallest units are called amoebas because each performs similarly to the simple microorganism. The amoeba is similar to a profit center because it bears profit responsibility.

▲ Amoebas divide and break up in response to changes in output and worker's added value per hour. The following illustrate how an amoeba responds to typical situations:

1. When output is low and the added value per labor hour is high, the amoeba must multiply.
2. When both output and added value per labor hour are high, the amoeba remains as it is.
3. When output is high and the added value per labor hour is low, the amoeba must scale down its members or rearrange its organization. If this is still ineffective, the amoeba must disband.
4. When both output and the added value per labor hour are low, the amoeba would be disbanded.

▲ An amoeba adopts an independent profit system, thus necessitating satisfactory transfer pricing. Internal competition among amoebas is keen and achieves the following goals:

1. Encourages amoeba members to produce better-quality and lower-cost products
2. Makes amoeba members aware of the importance of sound profit management
3. Teaches amoeba members about real market conditions

▲ One important performance measurement for amoebas is added value per hour.

▲ Many American firms are modular corporations: leaner, more flexible organizations that outsource many activities. The process of adding temporary employees because of downsizing and outsourcing is similar to

forming and disbanding amoebas.

CHAPTER SELF-TEST

Note: The notation (CO1) means that the question was drawn from chapter objective number one.

Matching

- a. Amoeba system
- b. Asset turnover ratio
- c. Controllable segment margin
- d. Flexible budget
- e. Functional income statement
- f. Investment center
- g. Product life cycle analysis
- h. Profit center
- i. Profit margin
- j. Profit variances
- k. Residual income
- l. Responsibility center
- m. Sales price variance
- n. Sales volume variance
- o. Segment margin

- _____ 1. (CO2) Responsibility center in which the manager has control over the incurrence of costs, the generation of revenues, and the deployment of investment funds.
- _____ 2. (CO3) Used for comparing the effects of differences between actual sales prices and costs, and budgeted sales prices and costs on the profit goals of the segment.
- _____ 3. (CO6) A responsibility system in which segments of an enterprise are divided into organic, flexible units that have full cost and profit responsibilities.
- _____ 4. (CO1) A segment of the organization in which a manager is held accountable for a specified set of activities and financial factors.
- _____ 5. (CO3) Measures the difference between budgeted and actual contribution margins due to a difference in the sales forecast and actual sales volume.
- _____ 6. (CO3) Used to evaluate the profit performance of a segment manager.
- _____ 7. (CO3) Financial statement format used in financial reporting.
- _____ 8. (CO2) A technique that helps managers determine how to allocate scarce resources to products or product lines in a manner that will maximize profitability.
- _____ 9. (CO5) Segment income divided by segment revenues.

- _____ 10. (CO2) Responsibility center in which the manager does not have control over the use of investment funds.
- _____ 11. (CO5) A measure of an investment center's earnings in relation to the minimum rate of return required by the corporation.
- _____ 12. (CO5) Segment sales divided by segment assets.
- _____ 13. (CO3) Measures the difference between budgeted contribution margin and actual contribution margin due to a difference in budgeted and actual sales prices.
- _____ 14. (CO3) A measure of the profitability of a segment.
- _____ 15. (CO3) Measures the difference between the master budget (pro forma income statement) and the actual profits of a segment.

Completion

Please write in the word or words which will complete the sentence.

- 1. (CO3) A _____ budget uses the actual sales volume realized by a segment.
- 2. (CO3) A _____ is a subtotal created by subtracting controllable direct fixed costs from contribution margin.
- 3. (CO5) _____ is calculated by dividing net operating income by average investment in assets.
- 4. (CO5) The segment margin remaining after providing the overall corporation with sufficient profits to cover its minimum required rate of return is _____.
- 5. (CO5) The _____ ratio measures the usage (effectiveness) of segment assets in creating sales revenues, and it is one of two ratios that make up _____.
- 6. (CO3) Profit variances include _____ variances and _____ variances.
- 7. (CO2) The segmented income statement reports the profitability of various segments within an organization unit, which can be segmented by _____,
_____, and/or _____.

8. (CO5) Investment center managers can improve their ROI by _____, _____, and _____.
9. (CO5) Three common choices when assigning a dollar value to assets are _____, _____, and _____.
10. (CO5) When valuing the assets of a segment, an enterprise may use current value, which is the amount required to _____ the segment's assets.

True-False Statements

- T F 1. (CO4) A responsibility accounting system is a graphical presentation of the types of products within a segment in terms of their cash flow-generating capabilities.
- T F 2. (CO3) Segment margin is calculated by dividing the direct fixed costs of a segment by its contribution margin.
- T F 3. (CO5) If a segment is comprised of old assets with a lower gross book value and greater accumulated depreciation, then its ROI will be lower than that of a new division with a large investment in assets and little accumulated depreciation.
- T F 4. (CO5) Using current value is an attractive way to value assets because it represents an enterprise's investment at the time the ROI is calculated; current value is commonly used because it is easy to determine and is not subject to dispute.
- T F 5. (CO5) Residual income is the net operating income that an investment center earns above some minimum rate of return on assets.
- T F 6. (CO6) When output is high and the added value per labor hour is low, the amoeba must scale down its members or rearrange its organization; if this is still ineffective, then the amoeba must disband.
- T F 7. (CO4) The dog product (quadrant) on the growth/share matrix has a modest + or - cash flow.
- T F 8. (CO4) At some point during the decline stage of the product life cycle, management may decide to hasten the product's decline so that cash can be generated to support products that will sustain the enterprise's profitability in the long run.

- T F 9. (CO4) If the add-or-drop question involves dropping a product, then only the avoidable fixed costs that can be realized by dropping the product are subtracted from that product's contribution margin: If the result is positive, then the product should be kept.
- T F 10. (CO2) When creating responsibility centers, all RCs require clear-cut lines of responsibility, and responsibility must be coupled with commensurate authority.

Multiple Choice

Please circle the correct answer.

1. (CO5) Which of the following ratios measures the efficiency of a segment in creating profits and is one of the two ratios comprising ROI?
 - a. Return on assets.
 - b. Profit margin.
 - c. Asset turnover ratio.
 - d. Acid-test ratio.
2. (CO4) Which of the following is a supplementary method used in add-or-drop decisions?
 - a. Profit variances.
 - b. Product life cycle analysis.
 - c. Growth/share matrix.
 - d. Both b and c above.
3. (CO5) The following data are presented for the Pooky Company:

Sales	\$ 50,000
Assets	\$250,000
Net income	\$ 15,000

What is Pooky Company's profit margin?

 - a. 6 percent.
 - b. 30 percent.
 - c. .2 times.
 - d. 3.33 times.
4. (CO5) Use the following data to determine which product has the highest residual income:

Product	Net Oper. Income	Min. Rate of Return	Operating Assets
W	\$50,000	18%	\$75,000
X	40,000	18%	50,000
Y	60,000	18%	90,000
Z	55,000	18%	65,000

- a. W.
- b. X.
- c. Y.
- d. Z.

5. (C06) Which of the following is true of Kyocera's amoeba system?
 - a. An amoeba is usually composed of 30 to 50 members.
 - b. An amoeba does not bear profit responsibility.
 - c. When there is a large amount of work or many kinds of tasks, an amoeba divides into smaller units.
 - d. The larger and more complex a unit, the more efficient and effective it is.
6. (C06) When output is low and the added value per labor hour is high, the amoeba must:
 - a. multiply.
 - b. remain as it is.
 - c. divide.
 - d. disband.
7. (C04) The growth/share matrix identifies the _____ as the product that has a high market share and a low market growth.
 - a. cash cow
 - b. star
 - c. problem child
 - d. dog
8. (C04) Which of the following quadrants of the growth/share matrix has a modest + or - cash flow?
 - a. Cash cow.
 - b. Star.
 - c. Problem child.
 - d. Dog.
9. (C04) In which stage of the product life cycle is the net profit normally the lowest?
 - a. Introduction.
 - b. Growth.
 - c. Maturity.
 - d. Decline.
10. (C04) In an add-or-drop decision, which of the following normally cannot be avoided by dropping a product line?
 - a. Common fixed costs.
 - b. Employee wages.
 - c. Traceable fixed costs.
 - d. Product line specialists' salaries.

	Divisions
<u>Garage Doors</u>	<u>Hollow-Metal Portals</u>
\$80,000	\$90,000
50%	40%
\$10,400	\$31,500
\$20,000	\$ 9,900

a. Prepare a segmented income statement for AAA. Include a column for the percentages. Assume common fixed costs are \$15,000.

b. Discuss the performance of each division of the company.

SOLUTIONS TO SELF-TEST

Note: The notation (Pg. 1) means that information about the question and its answer can be found on page 1 of your textbook.

Matching

- | | |
|----------------|-----------------|
| 1. (Pg. 939) f | 9. (Pg. 959) i |
| 2. (Pg. 950) d | 10. (Pg. 939) h |
| 3. (Pg. 966) a | 11. (Pg. 962) k |
| 4. (Pg. 932) l | 12. (Pg. 959) b |
| 5. (Pg. 951) n | 13. (Pg. 952) m |
| 6. (Pg. 948) c | 14. (Pg. 947) o |
| 7. (Pg. 946) e | 15. (Pg. 950) j |
| 8. (Pg. 954) g | |

Completion

1. (Pg. 950) flexible
2. (Pg. 948) controllable segment margin
3. (Pg. 958) Return on investment
4. (Pg. 962) residual income
5. (Pg. 959) asset turnover, ROI
6. (Pg. 950) sales, cost
7. (Pg. 939) product line, business function, geographic regions
8. (Pg. 959) increasing sales, reducing costs, reducing assets
9. (Pg. 961) gross book value, net book value, current value
10. (Pg. 961) replace

True-False Statements

- | | |
|-----------------|--|
| 1. (Pg. 955) F | This is the definition of a growth/share matrix. |
| 2. (Pg. 947) F | Segment margin = FC - CM |
| 3. (Pg. 961) F | ROI will be higher than that of a newer division. |
| 4. (Pg. 961) F | It is not widely used, is difficult to determine, and is disputable. |
| 5. (Pg. 962) T | |
| 6. (Pg. 967) T | |
| 7. (Pg. 955) T | |
| 8. (Pg. 954) T | |
| 9. (Pg. 953) T | |
| 10. (Pg. 943) T | |

Multiple Choice

- | | |
|----------------|---|
| 1. (Pg. 959) b | |
| 2. (Pg. 954) d | |
| 3. (Pg. 959) b | $\$15,000 \div \$50,000 = 30 \text{ percent}$ |
| 4. (Pg. 963) c | $\$60,000 - (\$90,000 \times .18) = \$43,800$ |
| 5. (Pg. 966) c | |

6. (Pg. 967) a
7. (Pg. 955) a
8. (Pg. 955) b
9. (Pg. 955) a
10. (Pg. 953) a

Demonstration Problem

a.	Company	%	Garage Doors	%	Portals	%
Sales	\$170,000	100.0	\$80,000	100	\$90,000	100
VC	76,000	44.7	40,000	50	36,000	40
CM	94,000	55.3	40,000	50	54,000	60
CFC	41,900	24.7	10,400	13	31,500	35
CSM	52,100	30.6	29,600	37	22,500	25
UFC	29,900	17.6	20,000	25	19,900	11
SM	22,200	13.0	9,600	12	12,600	14
COM FC	15,000	8.8				
NI	\$ 7,200	4.2				

- b. The controllable segment margin for the Garage Door Division is 37 percent, 12 percent better than that of the Hollow-Metal Portal Division's segment margin of 25 percent. This, on the surface, leads one to believe that the Garage Door Division manager is doing a better job than is the manager of the Hollow-Metal Door Division, but this information should not be used by itself. Each division's budget should be studied in order to take into consideration other differences between the two segments.

PRODUCT TRANSFERS WITHIN A COMPANY

CHAPTER OVERVIEW

In this chapter, you will learn about transfers of parts from one responsibility center to another within a company. You will learn about components and intermediate products, and about the management accounting system's goals for transfer costing and transfer pricing. You will also learn how the different cost and price options can affect managerial decision making, planning, cost management, and performance evaluation.

Review of Specific Chapter Objectives

1. Distinguish between components made in cost centers and intermediate products made in profit centers (pg. 1003).
 - ▲ A transfer involves moving a component part of a product from one responsibility center (RC) to another within a company.
 - ▲ There are two types of parts that can be transferred:
 1. components, which are parts that are not sold to outside customers.
 2. intermediate products, which are parts that can be sold to outside customers.
 - ▲ Cost centers within a factory produce components. Cost center managers are concerned with costs for planning, controlling, and evaluation purposes.
 - ▲ Profit center managers may be allowed to sell what they make rather than transferring it to another RC. These managers need information to help them determine whether to sell the product or to transfer it. The potential buying manager needs to know whether to purchase it internally or externally.
 - ▲ Upper management needs transfer information, too, because of its concern with maximizing the company's overall profit.
2. Understand the management accounting system's goals for transfer costing and transfer pricing (pgs. 1003 - 1021).
 - ▲ The following is a discussion of TRANSFERS FROM COST CENTERS.
 - ▲ A transfer cost is the value used in the accounting system to record required transfers from production cost centers.
 - ▲ Three issues must be decided:
 1. Should the value be based upon the component's sales price or cost?