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|  | **Cost Allocation, Customer-Profitability Analysis, and Sales-Variance Analysis** |
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Transition Notes

In this chapter, the section on criteria to guide cost-allocation decisions and the section discussing allocating corporate costs to divisions and products have been rewritten and updated. A section on customer-revenue analysis has been added to accompany the section on “customer-cost analysis.” The discussion on customer-level costs has been streamlined. There is a significant expansion of the discussion of customer-profitability profiles with the five-step decision model applied to managing customer profitability.

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| **Problem Material**  **Correlation Chart** |

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| --- | --- | --- | --- | --- |
| **15th**  **Edition** | **14th**  **Edition** |  | **15h**  **Edition** | **14th**  **Edition** |
| 16 | 16 |  | 28 | 28 Revised |
| 17 | 17 Revised |  | 29 | 29 Revised |
| 18 | 18 Revised |  | 30 | 30 Revised |
| 19 | 19 Revised |  | 31 | 31 Revised |
| 20 | 20 Revised |  | 32 | 32 Revised |
| 21 | 21 Revised |  | 33 | 33 Revised |
| 22 | 22 Revised |  | 34 | 34 Revised |
| 23 | 23 Revised |  | 35 | 35 Revised |
| 24 | 24 Revised |  | 36 | 36 Revised |
| 25 | 25 Revised |  | 37 | 37 Revised |
| 26 | 26 Revised |  | 38 | 38 Revised |
| 27 | 27 Revised |  | 39 | 39 Revised |

**I. LEARNING OBJECTIVES**

1. Discuss why a company’s revenues and costs differ across customers.
2. Identify the importance of customer-profitability profiles.
3. Understand the cost-hierarchy-based operating income statement.
4. Understand criteria to guide cost-allocation decisions.
5. Discuss decisions faced when collecting and allocating indirect costs to customers.
6. Subdivide the sales-volume variance into the sales-mix variance and the sales-quantity variance. Subdivide the sales-quantity variance into the market-share variance and the market-size variance.
7. **CHAPTER SYNOPSIS**

This chapter extends the discussion on allocation of indirect costs to products, identifying the reasons for such allocations and moving into the criteria and procedures for these allocations. The concept of allocating indirect costs to customers to determine customer profitability is introduced through a discussion of customer-level costs.

The sales-volume variance, introduced in Chapter 7, is expanded to provide management more detailed information about why sales deviated from the budgeted amounts. This variance is subdivided into two components: the sales-mix and sales-quantity variances. The sales-quantity variance is further subdivided into the market-share and market-size variances.

1. **POINTS OF EMPHASIS**
2. It is important that students distinguish between purposes for cost allocation and the criteria for doing so. As there are four of each, students sometimes confuse the two.
3. Customer-profitability profiles can best be grasped by the students through the use of examples. Going over the details contained in Exhibits 14-4 through 14-5 or by having the students work Problem 14-28 will help reinforce this section of the chapter.
4. Working a problem illustrating the sales-volume, sales-mix, sales-quantity, market-share, and market-size variances will help students grasp these concepts. Also, be certain that this section is tied into the variances as presented in Chapter 7. Problems 14-24 and 14-25 help to illustrate these concepts.

**IV. CHAPTER OUTLINE**

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| --- | --- |
| **LEARNING**  **OBJECTIVE** | 1 |
| Discuss why a company’s revenues and costs differ across customers  … revenues can differ because of differences in the quantity purchased and the price discounts given, whereas costs can differ because different customers place different demands on a company’s resources. | |
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1.1 **Customer-profitability analysis** is the reporting and analysis of revenues earned from customers and the costs incurred to earn those revenues. This will enable management to determine which customers are the most profitable and should be receiving a high level of attention from the company.

1.2 Two variables can be identified to explain revenue differences across customers:

* The quantity purchased.
* The amount of discount received. A **price discount** is the reduction of selling price below list price to encourage customers to purchase more.

1.3 Price discounts in practice occur for a number of reasons—volume, encouraging the customer to promote sales to others, poor negotiating by the salesperson.

1.4 Price discounts should be monitored in order to help improve customer profitability and also to be certain that the discounts are not illegal. Price discrimination, predatory pricing, and collusive pricing can all be illegal types of price discounts.

1.5 Revenues are only one aspect of customer profitability. A company must also look at the costs involved relating to various customers. The **customer-cost hierarchy** categorizes costs related to customers into different cost pools based on different cost drivers.

1.6 **Customer output unit-level costs** are costs of activities to sell each unit to a customer. Product handling is one such cost.

1.7 **Customer batch-level costs** are costs of activities related to a group of units sold to a customer. Costs incurred to process or deliver an order are examples of these costs.

1.8 **Customer-sustaining costs** are costs of activities to support individual customers regardless of the amount ordered by the customer. Sales visits to customers or costs of a display at the customer site are examples of these costs.

1.9 **Distribution-channel costs** are costs of activities related to a particular distribution channel rather than to each unit or batch of product or specific customer. The salary of a distribution manager would be an example of this type of cost.

1.10 **Division-sustaining costs** are the costs of activities that cannot be traced to individual customers or distribution channels. The salary of the division manager is an example.

**Refer to Quiz Question 4**

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| **LEARNING**  **OBJECTIVE** | 2 |
| Identify the importance of customer-profitability profiles  … highlight that a small percentage of customers contributes a large percentage of operating income. | |
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2.1 *Customer-profitability profiles* provide a useful tool for managers, as these profiles can be used to rank customers based upon customer-level operating income.

(Exhibits 14-4 and 14-5 illustrate customer cost and profitability analysis.)

2.2 The customer-profitability profile emphasizes short-term customer profitability. Other factors to be considered in the decision regarding allocation of costs among individual customers include:

* **Likelihood of customer retention.** The more likely a customer will continue to do business with a company, the more valuable the customer. Customers differ in their loyalty and willingness to shop around.
* **Potential for sales growth.** Is there a high likelihood that the customer’s industry and sales will continue to grow? If so, this may be a valuable customer.
* **Long-run customer profitability.** What does management think the future holds for the company in its relationship with the customer?
* **Increases in overall demand from having well-known customers.** Customers with established reputations help generate sales from other customers through product endorsements.
* **Ability to learn from customers.** Customers who provide ideas about new products or ways to improve existing products are especially valuable.

TEACHING POINT. This section contains a significant amount of marketing material. It is sometimes useful to move away from the “number crunching” and take the view from another business function. Have the students brainstorm positive or negative points relating to the factors above. For example, if an irate customer bellows, “fix this situation, or I am taking my business elsewhere,” the customer is probably not one with a great deal of loyalty and is unlikely to be a long-term customer.

2.3 The five-step decision-making process can be utilized in managing customer profitability. This can help identify customers who deserve the highest service and priority and those less-profitable customers.

**Refer to Quiz Question 5 Exercises 14-17, 14-18, 14-19**

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| **LEARNING**  **OBJECTIVE** | 3 |
| Understand cost-hierarchy-based operating income statement  … allocate only those costs that will be affected by actions at a particular hierarchical level. | |
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3.1 Exhibit 14-6 and 14-7 demonstrate the value of a hierarchical income statement format and the various degrees of objectivity when allocating other non-customer level costs.

**Refer to Quiz Question 2 Exercise 14-17**

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| **LEARNING**  **OBJECTIVE** | 4 |
| Understand criteria to guide cost-allocation decisions  … such as identifying factors that cause resources to be consumed. | |
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4.1 Exhibit 14-8 presents four criteria to guide cost-allocation decisions.

* **Cause-and-effect** is the primary criterion used in activity-based costing. It is also one of the preferred methods of allocation, as it has a linkage between the amount of cost incurred and the reason for the cost.
* **Benefits received** allocates the cost to the cost object that received the benefit of the cost.
* **Fairness** as a cost-allocation guide is problematic. Although it sounds noble to cite fairness as a criterion, fairness lies in the eyes of the beholder and it would be difficult to obtain agreement about what allocation is fair. Often the result would be that the person who is most persuasive would get the most favorable allocation. This is more of an objective in allocation rather than a valid criterion.
* **Ability to bear** is another problematic allocation criterion, as the costs are simply allocated based upon which cost object can best afford the allocation. This is, obviously, highly subjective and should be used only as a last resort.

TEACHING POINT. A large, downtown hotel allocated all of its restaurant labor costs on the basis of revenue dollars. This hotel had seven restaurant outlets that were vastly different, including banquet, room service, a bar, a 24-hour restaurant, and a fine-dining facility. There are obvious differences in the way labor resources are consumed in these various outlets. However, the most glaring example was in the banquet operation. Because banquets were not regularly scheduled events, the banquet manager hired servers as contract laborers. These costs were not included in the restaurant labor pool. Therefore, the banquet manager got charged for his actual labor, plus an allocation for labor he was not utilizing. As it worked out, the more banquets that were hosted, the lower the income shown by the banquet operation.

(Exhibit 14-2 lists the criteria for cost-allocation decisions.)

**Refer to Quiz Question 2 Exercise 14-17**

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| **LEARNING**  **OBJECTIVE** | 5 |
| Discuss decisions faced when collecting costs in indirect-cost pools  … determining the number of cost pools and the costs to be included in each cost pool | |
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5.1 In this section, we focus on the first purpose for cost allocation: to provide information for economic decisions, such as pricing, by measuring the full cost of delivering products.

* 1. In an ABC system, indirect-cost pools are defined for different activities and cost drivers are used as allocation bases to assign these costs to products. The goal is to achieve homogeneity in each pool—costs that are caused by the same cost driver.

5.3 Note that there are two stages of allocation: the allocation to the cost pool, then the allocation to the product. This section focuses on the first stage of allocation.

(Exhibit 14-9 diagrams indirect-cost pools and cost-allocation bases for two divisions.)

5.4 There are several options available to management in allocating corporate costs to divisions. As there is usually no direct cause-and-effect relationship for many of these costs, allocation of these costs presents difficulties.

5.5 Some companies allocate all corporate costs to divisions, because these costs are incurred to support division activities. This will motivate managers to examine how corporate costs are planned and controlled.

5.6 Other companies do not allocate any corporate costs to divisions because they are not controllable by the division managers.

5.7 Still other companies use a hybrid system, allocating corporate costs that are perceived to have a causal relationship to division activities or provide explicit benefits—human resources would be one example. This is generally the preferred method.

5.8 Once the decision is made regarding allocation of the corporate costs, management must then implement the decision. It is important that division managers are made aware of the allocation method.

**Refer to Quiz Question 3 Exercises 14-18 and 14-19**

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| **LEARNING**  **OBJECTIVE** | 6 |
| Subdivide the sales-volume variance in the sales-mix variance  … the variance arises because actual sales mix differs from budgeted sales mix  and the sale-quantity variance  … this variance arises because actual total unit sales differ from budgeted total unit sales  Subdivide the sales-quantity variance into the market-share variance and the market-size variance. | |
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6.1 Recall from Chapter 7 that the *sales-volume variance* is the difference between a flexible-budget amount and the corresponding static-budget amount. The sales-volume variance is calculated by subracting static-budget units sold from the actual number of units sold multiplied by the budgeted unit contribution margin.

6.2 A greater understanding of the sales-volume variance can be obtained when it is broken down into the *sales-mix variance* and the *sales-quantity variance.*

6.3 The **sales-mix variance** is the difference between the budgeted contribution margin for the actual sales mix and the budgeted contribution margin for the budgeted sales mix. It arises because the actual sales mix varies from the budgeted mix.

Sales-Mix Variance = (Actual Sales Mix – Budgeted Sales Mix) × Budgeted Contribution Margin per Unit

6.4 The sales-mix variance is best understood in terms of a **composite unit—**a hypothetical unit with weights based on the mix of individual units. A favorable sales-mix variance arises when the actual sales mix shifts toward the products having the largest contribution margins.

6.5 The **sales-quantity variance** is the difference between the budgeted contribution margin based on actual units sold of all products at the budgeted sales mix and contribution margin in the static budget. It arises because the number of units sold varies from the budget. A favorable sales-quantity variance indicates that the actual number of all products sold exceeds the budgeted units of all units sold.

Sales-Quantity Variance = (Actual Units of All Products Sold – Budgeted Unit of all Products Sold) × Budgeted Sales Mix Percentage × Budgeted Contribution Margin per Unit

(Exhibit 14-11 displays calculation of the flexible-budget and sales-volume variances.)

(Exhibit 14-12 illustrates calculation of the sales-mix and sales-quantity variances.)

(Exhibit 14-14 provides an overview of variances for Spring Distribution.)

**Refer to Quiz Questions 6, 7, and 8 Exercises 14-23 and 14-25; Problem 14-36**

**V. Other Resources**

To download these and other resources, visit the Instructor’s Resource Center [*www.pearsonhighered.com*](http://www.pearsonhighered.com/).

The following exhibits were mentioned in this chapter of the Instructor’s Manual, and have been included in the **PowerPoint Lecture presentation** created specifically for this chapter. You may use the PowerPoint Lecture presentations “as is”, or modify them to suit your individual needs.

Exhibit 14-2 summarizes details of costs incurred for marketing and administration, distribution, and customer service by activity for Provalue Division.

Exhibit 14-3 displays customer profitability analysis for Provalue customers.

Exhibits 14-5 illustrate customer cost and profitability analysis including the whale curve for cumulative profitability.

Exhibit 14-6 illustrates the cost hierarchy income statement for Provalue Division.

Exhibit 14-11 displays calculation of the flexible-budget and sales-volume variances.

Exhibit 14-12 illustrates calculation of the sales-mix and sales-quantity variances.

Exhibit 14-14 diagrams the relationship between different sales variances.

**CHAPTER 14 QUIZ**

1. Which of the following is *not* a primary purpose given in the text for allocating costs?
2. To provide information for economic decisions
3. To motivate managers and other employees
4. To measure income and assets for reporting to external parties
5. To foster cost awareness among managers to improve decisions
6. Which of the following is considered more of a matter of judgment rather than an operational criterion?
7. Cause-and-effect
8. Benefits received
9. Fairness or equity
10. Ability to bear
11. Homogeneity is used to
12. develop cost pools in which the costs have the same or similar cost-allocation base.
13. develop cost pools of similar amounts for allocation purposes.
14. develop cost pools based upon similarity of origination of costs to be allocated.
15. develop cost pools only for activity-based costing.
16. Information about price discounting can be useful in analyzing revenues of customers if
17. sales people are properly trained in sales forecasting.
18. records in the information system are kept of reductions in selling price below list price.
19. a strictly enforced company policy is in place regarding volume-based price discounts.
20. sales people are on an incentive plan that is based on revenues.
21. Which of the factors that managers must consider in deciding the allocation of resources across customers might provide misleading signals about dropping a current customer?
22. Potential for customer growth
23. Likelihood of customer retention
24. Long-run customer profitability
25. Ability to learn from customer

**Use the following information for questions 6 through 8.**

Natural Nutrients Bakery of Springfield produces three flavors of cat morsels that have budgeted and actual sales data for a bag of a dozen of their cat morsels as follows for December 2008:

Budgeted Data Actual Data

TunaFest ChikBits ChezNips TunaFest ChikBits ChezNips

Bags 7,200 4,800 4,000 10,800 3,600 7,200

CM per bag $2.50 $4.00 $5.00 $2.00 $3.00 $7.50

Cont. Margin $18,000 $19,200 $20,000 $21,600 $10,800 $54,000

Total Contribution Margin $57,200 $86,400

According to company forecasts, they were budgeting to earn a 25 percent market share in total units (bags) of specially prepared cat treats sold in December 2008 in Springfield. Reliable industry sources indicate that the total number of bags of cat treats sold for December 2008 in Springfield was 72,000.

1. The amount of Natural Nutrients Bakery’s *sales-volume variance* for December 2008 is

a. $3,600 F.

b. $20,200 F.

c. $20,020 F.

d. $29,200 F.

1. The *sales-quantity variance* for December 2008 for Natural Nutrients Bakery is

a. $3,600 F.

b. $20,200 F.

c. $20,020 F.

d. $29,200 F.

1. The *sales-mix variance* for December 2008 for Natural Nutrients Bakery is

a. $8,600 F.

b. $8,760 F.

c. $160 F.

d. $180 F.

**CHAPTER 14 QUIZ SOLUTIONS**

# 1. d

# 2. c

# 3. a

# 4. b

# 5. c

# 6. b

# 7. c

# 8. d

**Quiz Question Calculations**

6. Act Total

Unit Sales Act Sales Mix BudCM

Tuna Fest 21,600 × 1/2 × $ 2.50 = $27,000

ChikBits 21,600 × 1/6 × $ 4.00 = 14,400

ChezNips 21,600 × 1/3 × $ 5.00 = 36,000

$77,400

Budgeted CM 57,200

Sales-Volume Variance $20,200 F

7. Act Total

Unit Sales Bud Sales Mix BudCM

TunaFest 21,600 × 0.45 × $ 2.50 = $24,300

ChikBits 21,600 × 0.30 × $ 4.00 = 25,900

ChezNips 21,600 × 0.25 × $ 5.00 = 27,000

$77,220

Budgeted CM 57,200

Sales-Quantity Variance $20,020 F

8. From #7 $77,220

From #6 77,400

Sales-Mix Variance $ 180 F