

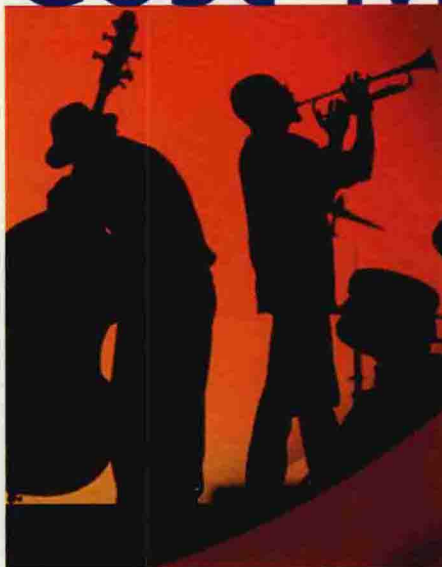
# Cost Management

The background of the cover features a dark, textured surface with a large, glowing red and orange arc that sweeps across the upper half. Below this arc, the silhouettes of four musicians are visible against the lighter background. From left to right, there is a standing figure, a saxophone player, a double bass player, and a seated figure. The overall mood is artistic and dynamic.

*Measuring,  
Monitoring,  
and Motivating Performance*

**Leslie G. Eldenburg  
Susan K. Wolcott**

# Cost Management



► Measuring,  
Monitoring,  
and  
Motivating  
Performance

**Leslie G. Eldenburg, PhD**

*University of Arizona*

**Susan K. Wolcott, PhD, CPA, CMA**

*WolcottLynch Associates*

## **A Musical Note**

If you think about it, jazz music is a good analogy for cost accounting. Jazz is an enticing mix of *structure*, *interaction*, *context*, and *creativity*. These are also the core ingredients of this text.

*Cost Management* has a unifying *structure* to help students approach, understand, and apply accounting information. It analyzes, the *interaction*, or exchange, between accounting information and sound decision making. It shows students the importance of the business *context*, the understanding of which is critical to cost management and high quality business decisions. And it helps students develop the *creativity* needed for good decision-making, stimulating them to think about accounting problems and problem-solving in more complex ways.



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## DEDICATION

We dedicate this textbook to Cindy Lynch, whose ideas stimulated us to write a student-oriented book with the specific objective of using cost accounting content and cognitive development theory to improve critical thinking skills. Cindy introduced Susan to cognitive development research literature, and together they developed and refined the *Steps for Better Thinking* model. Cindy helped us at the beginning of our work on the textbook. We sorely missed her help after her untimely death in early 2001. This textbook memorializes her life and work.

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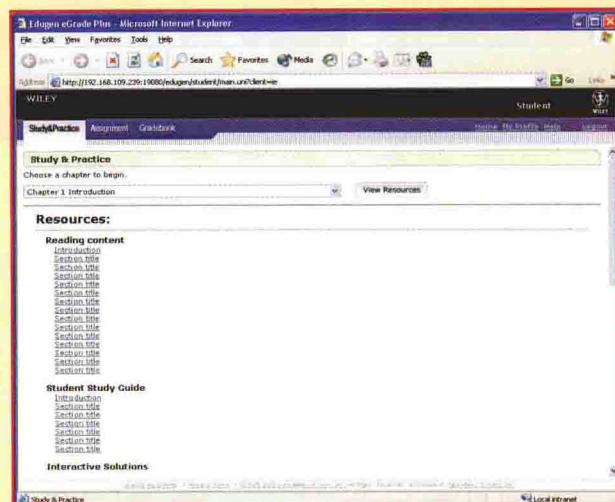
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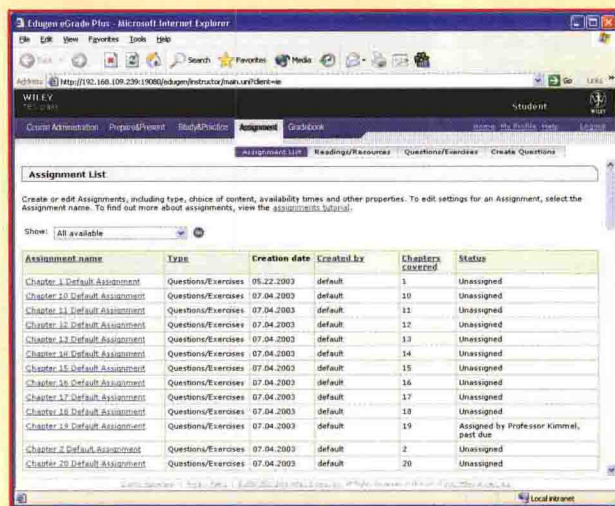
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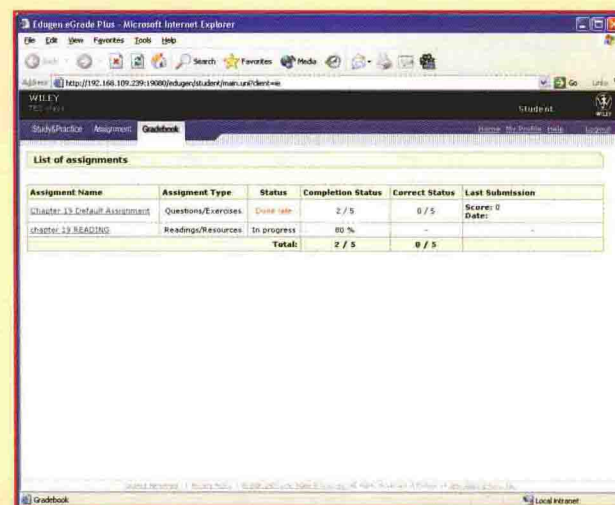
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# About the Authors

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Leslie G. Eldenburg, PhD, is a McCoy-Rogers Fellow at the University of Arizona. She has also taught at California State University–Fresno. She received her MBA and PhD from the University of Washington. She passed the CPA exam in 1985 and has taught review courses for the CMA exam. Leslie has served as faculty advisor for an IMA student chapter and for the Multicultural Business Student Association. She received a number of awards recognizing her activities in teaching, student support, and as faculty advisor for student organizations. She is an active member of the American Accounting Association (AAA), the Management Section of the AAA, the IMA, and the Healthcare Financial Management Association. She has served on and chaired numerous committees within these organizations and currently is the Management Section's Secretary-Treasurer and co-chairs its Doctoral Consortium Committee. Before becoming an academic, she worked in hospital finance at Virginia Mason Hospital in Seattle, Washington. Her research interests include issues in healthcare and hospital accounting, and she has published in *The Accounting Review*, *The Journal of Accounting and Economics*, *The Journal of Medical Decision Making*, *The Journal of Corporate Finance*, *The International Journal of Accounting*, *Information Systems Research*, *Healthcare Financial Management*, and *Controller's Quarterly*. In addition, she currently serves on several editorial boards. Leslie has also co-authored chapters in *Health Care Administration*, *The Encyclopedia of Accounting*, and the forthcoming *Handbook of Management Accounting Research*, and *Handbook of Cost Accounting*.



Susan K. Wolcott, PhD, CPA, CMA, is an educational consultant with WolcottLynch Associates. Her consulting practice takes her to conferences and campuses around the world where she works with faculty and programs to support critical thinking development, competency assessment, and curriculum innovation. Her publications include *Developing Critical Thinking Skills: The Key to Professional Competencies*, an American Accounting Association Academic Partners Toolkit. She chaired the AICPA Core Competency Framework Curriculum Evaluation Task Force, developed the Taxonomy of AICPA Core Competencies, and authored numerous assessment materials for the AICPA Educational Competency Assessment Web site. Additional publications can be found in *Issues in Accounting Education*, *Journal of Accounting Education*, *Assessment Update*, *IDEA Center Papers*, and other journals. She is a member of the AAA, IMA, IIA, and Washington Society of CPAs, where she participates on the Consulting Services Committee. She previously served on the board of directors, as President of the Educational Foundation, and as Chair of the Education Committee of the Colorado Society of CPAs. She also served as Vice President of Membership for the Portland-Columbia Chapter of the IMA and was a program committee member and presenter for the AACSB Outcomes Assessment Seminar. She was previously on the accounting faculty at the University of Denver, where she received the MBA Core Diamond Award for teaching. She regularly teaches CPA and CMA review courses, and she has also taught courses at the University of Washington, Helsinki School of Economics—Mikkeli, Instituto de Empresa in Madrid, and J. L. Kellogg Graduate School of Management at Northwestern University. She worked in public accounting for ten years, including three years with Coopers & Lybrand (Portland, Oregon). She holds PhD and MS degrees in Accounting and Information Systems from Northwestern University and a BBA in Accounting from the University of Portland.

# Preface

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## BRIDGING THE GAP

*Cost Management: Measuring, Monitoring, and Motivating Performance* was written to help students learn to appropriately apply cost accounting methods in a variety of organizational settings. To achieve this goal, students must also develop professional competencies, such as strategic/critical thinking, risk analysis, decision making, ethical reasoning, and communication. Most textbooks focus on content knowledge and then expect students to “magically” demonstrate professional competencies. As an author team, we bring to this textbook extensive knowledge about cost accounting as well as about the best approaches for teaching and learning professional competencies. This textbook bridges the gap between typical student performance and what we would like students to be able to do by

- Maintaining a central focus on business decision making.
- Explicitly addressing uncertainties and biases.
- Adopting a writing style that is accessible and interesting to students.
- Concentrating on all types of organizations.
- Focusing on ethical reasoning.
- Simultaneously challenging and guiding students to learn.
- Helping instructors assess student competencies.

**Maintaining a Central Focus on Business Decision Making** A decision-making model, *Steps for Better Thinking*, is introduced in Chapter 1, and the focus on decision making continues throughout the remainder of the textbook and its supplements, including homework, assessment material, and online practice. This approach helps students understand that *memorizing the material is not good enough*. Specifically, it helps students

- Recognize the role of cost accounting in providing information used by managers and other decision makers.
- Learn content knowledge more deeply and apply it more readily when learned in the context of real business problems.
- Go beyond mechanical applications and analyze and adapt cost accounting methods to their organization’s situation.
- Learn to evaluate the usefulness of new accounting methods and business practices that will arise in the future.

**Explicitly Addressing Uncertainties and Biases** Many students fail to recognize that cost accounting information is subject to uncertainties and biases. This failure causes them to place undue reliance on computational results and inhibits their ability to evaluate the assumptions, limitations, behavioral implications, and qualitative factors that influence business decisions. These types of weaknesses inhibit student development of professional competencies such as the IMA’s Knowledge, Skills, and Abilities (KSAs). To overcome these weaknesses, *Cost Management* explicitly addresses uncertainties and biases in the content and homework problems in every chapter.

**Adopting a Writing Style that Is Accessible and Interesting to Students** *Cost Management* is written in a style that students can easily understand, and it incorporates interesting scenarios that pique student interest. The goal is to help students learn the basic cost accounting knowledge on their own before they come to class so that class discussions can be used to further develop their accounting expertise and to focus on more complex issues such as qualitative factors that influence information and decisions, and the effects of uncertainty and bias.

**Concentrating on All Types of Organizations** Manufacturing is now a small part of U.S. business, while service and not-for-profit organizations are increasingly important. Our students need to apply cost accounting techniques in a variety of settings. Accordingly, we focus throughout the textbook on a wide range of business organizations, including large and small, public and private, U.S. and international, manufacturing, retail, service, and not-for-profit. Real organiza-



tions include **Motorola, Reichhold, Hyperion, and Charleston County Council**. Hypothetical organizations include Small Animal Clinic, Die Gefleckte Kuh Eis (The Spotted Cow Creamery), Nighthawk Law Firm, Aluminum Benders, and Middletown Children's Clinic. Students learn to apply cost accounting in different settings, and they also learn about the types of decisions and factors that are important to different types of organizations.

**Focusing on Ethical Reasoning** The accounting profession currently faces negative media attention and increased governmental regulation, largely because a number of accountants and managers have behaved unethically. To develop better ethical reasoning skills, students need greater exposure to realistic ethical issues. *Cost Management* avoids scenarios that have simplistic, “correct” solutions. Instead, the ethical dilemmas contain ambiguities, conflicts of interest, and value judgments. The textbook presents a framework for ethical decision making in Chapter 1. Students will use this framework when addressing ethical dilemmas in every chapter. With this continual practice, students are likely to develop their own process for ethical decision making to use within other classes and over their careers.

**Simultaneously Challenging and Guiding Students to Learn** Educational research indicates that students need repeated practice with *appropriately designed* learning activities to develop professional competencies such as strategic/critical thinking. Students must be challenged to develop new skills, but at the same time they need guidance so that they do not falter and become discouraged.

A significant and innovative feature of this textbook is the use of a decision-making model, *Steps for Better Thinking*, as a pedagogical tool to foster students' analytical and critical thinking skills. The model is used to analyze chapter-opening vignettes, help students tackle ethical scenarios, and structure the end-of-chapter problem material. The model helps instructors build a better syllabus by identifying the complexity of homework problems and helping them anticipate potential student difficulties. It also reduces student confusion about what they are expected to do and encourages them to think about accounting problems more complexly. *Steps for Better Thinking* is used to identify levels of competency in the AICPA Core Competency Framework, so it is tied directly to the competencies students need for entry to the accounting profession.\*

*Steps for Better Thinking* also helped us increase the connection of chapter content with end-of-chapter material. Instead of expecting students to “magically” apply content knowledge to complex business problems, the homework problems guide students through the thinking process. Longer problems are broken down into a series of questions that first address cost accounting material and then apply the material to more complex questions involving uncertainties, biases, behavioral issues, analytical reasoning, and judgment.

**Helping Instructors Assess Student Competencies** Instructors and programs are increasingly called on to assess student learning outcomes. However, they often struggle in their efforts to assess competencies such as decision making, risk analysis, and strategic/critical thinking. A unique and value-added feature of *Cost Management* is that it incorporates a pre-course problem (available in the Instructor's Manual), plus one or two problems in each chapter of the textbook (identified by a ☆ icon) that are designed for assessment of such competencies. A detailed assessment rubric, student examples, and a discussion of typical student approaches for each of these problems are available on the Instructor's Web site. The assessment methodology corresponds with materials on the *AICPA Educational Competency Assessment Web site*.\*

Use of the assessment problems and resources is optional. Some instructors may elect to use one or more assessment problems to learn more about their students' strengths and weaknesses as they teach the cost accounting course. Others may use these resources as part of a program assessment plan.

## ORGANIZATION OF COST ACCOUNTING CONTENT

*Cost Management* includes traditional as well as the most current practices in cost accounting. The focus is on methods that will be useful to students in their professional careers. First we introduce the students to relevant costs and their use in decision making, including cost functions and cost behavior. Then, once students understand cost behavior, they are better able to under-

\*Available online at [eca.aicpaservices.org](http://eca.aicpaservices.org).



stand the uses and limitations of cost allocations. Because performance measurement and evaluation relies on a thorough understanding of both decision making and allocation information, the last section of the book considers a variety of performance measurement and evaluation techniques and issues. Following is a more detailed description of each of these three sections. We view some topics, such as **quality** and **international practices**, as pervasive. Therefore, we include these topics throughout the textbook rather than as stand-alone chapters.

### ■ Part I. Measuring and Using Costs for Management Decisions

The chapters in Part I focus on identifying and using relevant information for management decisions. Chapter 1 introduces a decision-making framework that is used throughout the textbook. This framework helps students describe management decisions, identify relevant costs, evaluate the quality of information used in decisions, and develop ethical decision-making skills. Chapters 2, 3, and 4 address ways to categorize costs, analyze cost behavior, and use costs to make decisions. This approach motivates student interest in course material by immediately involving them in realistic business problems. Focusing on decisions also allows students to relate cost accounting material to their own personal lives, increasing their perceptions of course relevance.

### ■ Part II. Measuring and Assigning Costs for Internal and External Reporting

The chapters in Part II explore the assignment of costs to products and other activities of an organization. Chapter 5 begins with the relatively simple assignment of costs to customized products and services. Chapter 6 introduces the more complex cost assignment methods used in process costing. Chapter 7 explores the development and use of activity-based costing and activity-based management. Chapters 8 and 9 present the more specialized practices for assigning costs for support departments, joint products, and byproducts. This section helps students move beyond a purely mechanical application toward a deeper understanding of the reasons behind and limitations of cost assignment techniques. We also introduce basic concepts related to standard costs and overapplied and underapplied overhead beginning with Chapter 5. This approach more closely ties chapter content to contemporary business practice.

### ■ Part III. Planning, Monitoring, and Motivating

The chapters in Part III use budgets and benchmarks to plan and monitor financial and nonfinancial performance. These chapters also examine the use of incentives and compensation, combined with benchmarks, to motivate performance. Chapters 10 and 11 focus on the development and use of budgets and benchmarks. Chapter 12 addresses long-term, strategic investment decisions. Chapter 13 introduces contemporary issues related to pricing and cost management. Chapter 14 examines various ways to measure and report costs for internal and external income statements. Chapter 15 provides an overview of financial performance measures and introduces the challenges that accountants and managers face when motivating performance inside organizations. In Chapter 16, the balanced scorecard is presented as a method for using both financial and nonfinancial information to help achieve an organization's strategic goals. Although students are asked to consider the behavioral influences of accounting practices throughout the textbook, Part III focuses more specifically on the motivational uses of accounting information. Students are asked to recognize both intended and unintended behavioral consequences of performance metrics.

### ■ Sequencing

We have written the chapters so that they can be taught in any sequence, although we recommend that the first two chapters be taught sequentially at the beginning of the course. The instructor's resources provide several examples of syllabi using the chapters in different sequences. Margin notes are used to refer students to more detailed information about a topic that is addressed in another chapter.

## CHAPTER FOCUS

### ■ Chapter 1: The Role of Accounting Information in Management Decision Making

Chapter 1 provides an overview of organizational decision making and introduces students to the use of cost accounting information in decision making. Techniques for identifying and using relevant information are reviewed. A model for developing higher quality decisions (*Steps for Better Thinking*) is introduced. Finally, this model is applied to ethical decision making. We do not introduce basic accounting terms in this chapter but give students a general overview of the importance of cost accounting information.

### ■ Chapter 2: The Cost Function

We first review accounting terms that relate to cost behavior and explain the cost function. At this point we also discuss limitations of the information produced by cost functions and problems with uncertainties and bias in developing cost functions. This focus allows students to consider the quality of information as they learn cost accounting methods. We present and illustrate techniques that are used to describe cost behavior (engineered estimates, analysis at the account level, two-point method, and regression analysis). Scatterplots are introduced as a way to provide additional information about cost behavior. Linear and nonlinear (e.g., learning curves) cost functions are presented. Although this chapter is longer than our other chapters, the first part is primarily a review of relevant cost terms that students know from introductory managerial accounting.

### ■ Chapter 3: Cost-Volume-Profit Analysis

Single and multiple product examples are used to explore the development and use of CVP information, before and after taxes. Examples of spreadsheets with input sections and cell referencing are introduced so that students can easily perform sensitivity analysis. Because of the early focus on bias and uncertainties, students better understand the need for sensitivity analysis. Qualitative factors are explored, as are problems with uncertainty and bias. The margin of safety and operating leverage are introduced and then used to analyze risk of operations. Examples show the use of CVP information for both decision making and monitoring purposes. One of the homework problems asks students to develop a spreadsheet that can later be altered to calculate information needed to answer questions presented in the San Jose Chips Case that may be used with this chapter.

### ■ Chapter 4: Relevant Costs for Nonroutine Operating Decisions

Nonroutine decisions such as special order, make or buy, keep or drop, product emphasis, and maximizing constrained resources are covered in Chapter 4. This chapter is placed early in the text to allow students additional practice in developing and using cost function information. We find that students better understand the relevancy of their cost accounting course when they immediately use skills that are taught early in the course. In addition, relatively simple decision-making scenarios allow greater discussion of qualitative factors that potentially override quantitative results. Linear programming software is used to solve for optimal sales mixes when resources are constrained. As in all of our chapters, the effects of uncertainty and bias on decision making are also explored.

### ■ Chapter 5: Job Costing

Chapter 5 introduces job costing and accounting for spoilage under job costing. The first part of the chapter reviews job-costing basics in a manufacturing setting and then extends this method to the service sector. Actual versus normal job costing methods are compared, and calculations for over- and under-applied overhead are explained. An example in this chapter highlights potential problems that arise if allocated costs are part of the information used to choose between two different jobs when there are capacity constraints. We also include a discussion of the costs of spoilage, rework, and scrap in job costing, describing opportunity costs that arise from poor quality. Behavioral implications of the accounting methods used to record spoilage are explored.



## ■ Chapter 6: Process Costing

Chapter 6 presents process-costing methods using FIFO, weighted average, and standard costs. We developed a single format that is used to calculate equivalent units for both the FIFO and weighted average methods. This format also helps students understand the difference between the two methods. In this chapter's examples, an accountant makes a decision about the best process costing method for her organization, comparing and contrasting information from FIFO and weighted average methods. In addition, accounting methods for the spoilage, rework, and scrap that arise in mass production are illustrated.

## ■ Chapter 7: Activity-Based Costing and Management

A team of employees implements an ABC system in this chapter, and information from the ABC system is compared to that from a traditional job costing system. ABM is described using a specific example for customer-related costs. In another ABM example, an accountant develops quality cost information aimed at reducing costs while improving quality. The benefits, costs, and limitations of ABC systems are discussed, as well as recent academic research results.

## ■ Chapter 8: Measuring and Assigning Support Department Costs

The direct, step-down, and reciprocal methods are described and illustrated in this chapter. Excel Solver is used to develop costs for the reciprocal method. Allocations are illustrated using a not-for-profit children's clinic. Information from single- versus dual-rate allocation methods is compared. The quality of support cost allocation information is discussed, with emphasis on its limitations, including behavior implications.

## ■ Chapter 9: Joint Product and By-Product Costing

Physical volume, sales at the split-off point, net realizable value, and constant gross margin NRV methods are compared and contrasted in this chapter. Appropriate use of relevant cost information for decisions about further processing is discussed. Main products and by-products are defined, and methods for accounting for by-products are compared and contrasted.

## ■ Chapter 10: Static and Flexible Budgets

After illustrating the development of a static budget, adjustments are made to develop a flexible budget reflecting activity levels, price changes, and elimination of costs over which managers have no control. This treatment of static and flexible budgeting reflects the actual sequence of events used by most businesses. Students better understand that forecasts are made, developed into a budget, and then adjusted to develop a benchmark as actual operations unfold. For instructors who want students to have more in-depth knowledge of static budgets, the Appendix includes an example of a detailed cash budget. We also introduce participative, zero-based, rolling, ABC, and kaizen budgets. Behavioral aspects of budgeting are explored, as are the effects of uncertainties and bias in budget information.

## ■ Chapter 11: Standard Costs and Variance Analysis

The development and use of direct and overhead cost standards and variances are presented in this chapter. Behavioral effects arising from the use of this information are explored through an example in which a purchasing department buys cheaper materials that require more labor time and effort. In the Appendix, profit-related variances (revenue and contribution margin-related variances) are described and calculated.

## ■ Chapter 12: Strategic Investment Decisions

Net present value analysis and other capital budgeting techniques are described, and then compared and contrasted in this chapter. Examples with increasing complexity develop

capital budgeting with income taxes. Inflation effects are considered in the Appendix using both the real rate and nominal rate methods. Uncertainties and bias in capital budget information is emphasized in this chapter. A case developed for this chapter requires that students use their own judgment to choose an appropriate MACRS schedule, the life of the project, and discount rates (including a risk premium specific to this decision), among others.

### ■ Chapter 13: Joint Management of Revenues and Costs

Students learn to develop and implement Target, kaizen, and life cycle costing systems. Product pricing techniques (cost and market based) are also introduced, with emphasis on current pricing practices that are based on demand. An economic model is introduced to calculate a profit-maximizing price.

### ■ Chapter 14: Measuring and Assigning Costs for Income Statements

Absorption, variable, and throughput income statements are compared and contrasted. Factors that affect the choice of fixed overhead allocation rate volume measures (theoretical, practical, normal, and budgeted) are explored. The uses and limitations of information produced by these three income statements are discussed. Several examples and homework problems address the incentives under absorption costing of inventory buildup to improve this period's income.

### ■ Chapter 15: Performance Evaluation and Compensation

Agency theory and responsibility accounting are introduced to explore the assignment of decision-making authority and responsibility. Performance evaluation measures (ROI, residual income, and EVA) are compared and contrasted. Transfer pricing approaches are illustrated. Incentives that give rise to sub-optimal decision making are described for each type of performance measure and transfer price policy.

### ■ Chapter 16: Strategic Performance Measurement

This chapter emphasizes the strategic decision-making model introduced in Chapter 1, highlighting the role of long-term strategic decision making. The balanced scorecard is then introduced as a method that can be used to combine financial and non-financial performance measures to gauge progress and motivate employees. The strengths and weaknesses of the balanced scorecard are discussed, including uncertainties about the best choice of measures, mistakes in implementation, and the effects of bias on performance measure choices.

## TARGET AUDIENCE

*Cost Management* was written primarily for a junior or senior-level undergraduate cost accounting course. However, the focus on decision making and the real-world emphasis also makes the textbook appropriate for a master's level or graduate course.

## QUALITY CONTROL

We have made every effort to eliminate errors and create high-quality materials. We each reviewed and checked the details in final drafts of all chapters and solutions, and we obtained the usual reviews from cost accounting instructors and proofreaders. *To ensure further accuracy and to evaluate the connection of the assignment materials with the chapter content*, faculty reviewers, in several passes, checked the wording of end-of-chapter material, ensured that all concepts within the chapter are practiced in homework material, and verified that the solutions provide adequate explanation and use the same terminology and



formats as illustrated in the textbook. To ensure that all resources are tightly connected to the chapter content, we assumed responsibility for preparation of the Solution Manual, Instructor's Manual, and assessment materials. In addition, we co-authored the Test Bank and worked closely with the author of the study guide. We personally made sure that all terminology and methods are consistent with the chapters *and that the test bank includes questions requiring students to demonstrate analysis and strategic/critical thinking, in addition to the typical questions involving cost accounting content.*

## CHAPTER FEATURES

*Cost Management* uses a number of pedagogical features in each chapter to enhance teaching and learning.

### Learning Objectives

At the beginning of each chapter, several questions are posed to provide a structure for student learning. These questions also appear in the margins where the material is first presented, organize the chapter summary, and identify homework material and test bank problems.

#### This Chapter Addresses the Following Questions:

- Q1** How is activity-based costing (ABC) different from traditional costing?
- Q2** What are activities, and how are they identified?
- Q3** What process is used to assign costs in an ABC system?
- Q4** How are cost drivers selected for activities?
- Q5** What is activity-based management (ABM)?
- Q6** What are the benefits, costs, and limitations of ABC and ABM?

### Chapter Opener and Analysis

The chapter-opening example motivates students by presenting an interesting, real-world application of chapter material. It is followed by an analysis of the business decision-making process demonstrated in the vignette, using the framework of *Steps for Better Thinking*.

Here is an example from Chapter 1. Please turn to Chapter 1 to see the discussion that follows.

#### MOTOROLA'S IRIDIUM PROJECT: LOOK BEFORE YOU LEAP

In 1985, while vacationing in the Caribbean, the wife of a Motorola executive became frustrated because she could not call clients using her cell phone. Over time, her frustration led to the creation of a research team, including the executive, to address the problem. The team envisioned a 77-satellite network orbiting the earth so that cellular phones could be used for international calls without interruption (Finkelstein and Sanford, 2000; Smolowitz, 1999). In 1991, Motorola formed a separate company, Iridium, to share the risk and cost of the project with a global consortium of firms. Iridium became a public company in 1997.

In late 1998, the first phones were sold. The company charged \$3,000 for each phone, and calls cost \$4 to \$9 per minute. Fewer customers signed up for service than predicted—only 20,000 during the first 10 months. Motorola had predicted two million users by 2002 (Smolowitz, 1999). After spending \$5 billion on development, Iridium defaulted on \$1.5 billion in bonds and declared bankruptcy in August 1999. It was one of the 20 largest bankruptcies in U.S. history (Finkelstein and Sanford, 2000).



What went wrong? The cell phones were bulky and could not be used inside buildings. During the 11 years of Iridium's development, land-based cellular service expanded faster than expected, and customer expectations changed. With the high costs, customers required more sophisticated technology in the phone sets. In addition, Iridium's partners failed to provide adequate sales teams and marketing plans (Finkelstein and Sanford, 2000).

Marketing professors Jagdish Sheth of Emory University and Rajendra Sisodia of Bentley College argued that Iridium's technology and marketing were flawed and that managers apparently fell into a "sunk cost fallacy." Managers continued to invest in the project after it should have been abandoned (Sheth and Sisodia, 1999). ■

SOURCES: S. Finkelstein and S. H. Sanford, "Learning from Corporate Mistakes: The Rise and Fall of Iridium," *Organizational Dynamics* 29, no. 2 (2000), pp. 138-148; J. N. Sheth and R. Sisodia, "Manager's Journal: Why Cell Phones Succeeded Where Iridium Failed," *The Wall Street Journal*, August 23, 1999, p. A14; I. Smolowitz, "Iridium: Lessons for all Companies," *Business Forum* 24, no. 1/2 (2000), pp. 17-38; and J. Schack, "Iridium Splashes Down," *Institutional Investor*, January 2000, p. 98.



### DIE GEFLECKTE KUH EIS (THE SPOTTED COW CREAMERY) (PART 2) THE INFLUENCE OF SALES MIX ON PROFITABILITY

The owner of The Spotted Cow Creamery has several profitable stores. He asked the store managers to provide information about their sales mix, specifically the amount of beverage versus ice cream products sold. Beverages provide a much larger contribution margin than ice cream. After analyzing the data, he found that about half of the revenues in the most profitable stores were for the sale of beverages. In addition, these stores have more stable sales throughout the winter because they sell specialty coffee beverages as well as soft drinks.

The owner shared this information with Holger, the manager of a less profitable store. Holger investigates the contribution margins from beverages and ice cream at his store. He sets up a spreadsheet to examine the influence of the sales mix on profitability, shown in Exhibit 3.5(a). He finds that beverages are about 15% of total revenue ( $€6,000 ÷ €40,000$ ). The contribution margin ratio for beverages is 93% ( $€5,600 ÷ €6,000$ ), whereas the contribution margin for ice cream is 42% ( $€14,400 ÷ €34,000$ ). When he changes the desired sales mix in the spreadsheet from 15% to 50% beverages to match the sales mix of more profitable stores, the after-tax income increases by a sizeable amount from 3,000 to 8,353 as indicated in Exhibit 3.5(b).

Holger realizes that several strategies would increase the percentage of beverages in his current sales mix. First, he could require the sales clerks to suggest a beverage with each sale. In addition, he could emphasize beverages in his advertising. He could also analyze his competitors' beverage prices to be certain that his prices are competitive. A small drop in the price of beverages might increase the volume of beverages sold more than enough to offset the decline in contribution margin ratio. He uses the spreadsheet to perform sensitivity analysis around these factors.

EXHIBIT 3.5 Spreadsheet for The Spotted Cow Creamery

	A	B	C	D		A	B	C	D
1					1				
2	Input section				2	Input section			
3		Beverage	Ice Cream	Total	3		Beverage	Ice Cream	Total
4	Revenue	€6,000	€34,000	€40,000	4	Revenue	€6,000	€34,000	€40,000
5	Variable cost	400	19,600	20,000	5	Variable cost	400	19,600	20,000
6	Current sales mix in revenues	15%	85%	100%	6	Current sales mix in revenues	15%	85%	100%
7	Fixed costs			16,000	7	Fixed costs			16,000
8	Tax rate			30%	8	Tax rate			30%
9	Desired sales mix in revenues	15%	85%	100%	9	Desired sales mix in revenues	50%	50%	100%
10					10				
11				Weighted Average	11				Weighted Average
12	Contribution margin ratio	93%	42%	60%	12	Contribution margin ratio	93%	42%	68%
13					13				
14	Income statement				14	Income statement			
15	Revenue	€6,000	€34,000	€40,000	15	Revenue	€30,000	€34,000	€64,000
16	Variable cost	400	19,600	20,000	16	Variable cost	1,300	11,300	12,600
17	Contribution margin	5,600	14,400	20,000	17	Contribution margin	18,667	8,471	27,137
18					18				
19	Fixed costs			16,000	19	Fixed costs			16,000
20	Pretax income			4,000	20	Pretax income			11,137
21	Taxes			1,000	21	Taxes			3,341
22	After tax income			3,000	22	After tax income			7,796

(a) Current Sales Mix

(b) Desired Sales Mix

## Realistic Examples

After the presentation of a major cost accounting method, a realistic example of an organizational setting with interactions between accountants and managers demonstrates the method and introduces qualitative factors and relevant decision-making issues. The same setting is often used several different times in a chapter to introduce various aspects of each method. These examples enhance student learning by demonstrating cost accounting methods, clarifying the business context, and raising issues addressed by accountants, managers, and others.

This is a retail sector example from Chapter 3 (Cost-Volume-Profit Analysis).

## GUIDE YOUR LEARNING 3.3 The Spotted Cow Creamery (Part 2)

The Spotted Cow Creamery (Part 2) illustrates the influence of sales mix on profitability. For this illustration:

Compute It	Identify Uncertainties	Explore Uses
For Exhibit 3.5, manually recalculate: <ul style="list-style-type: none"> <li>• Sales mix in units</li> <li>• Sales mix in revenues</li> <li>• Weighted average contribution margin ratio</li> </ul>	At the end of the illustration, the store manager was considering several strategies for changing his store's sales mix. What uncertainties does the manager face?	How was CVP information used by the owner? How was it used by the manager?

## Guide Your Learning

After major sections in each chapter, *Guide Your Learning* boxes give students the opportunity to confirm their understanding of key terms and concepts and analyze the cost accounting methods introduced in the chapter examples. They are asked to identify problems and uncertainties, explore the pros and cons of alternatives, evaluate behavioral implications, and recognize decision maker values and priorities. Suggested answers to these questions are available to instructors and students online at [www.wiley.com/college/eldenburg](http://www.wiley.com/college/eldenburg).



## Focus on Ethical Decision Making

Each chapter includes an ethical dilemma. As a follow-up, one or more homework problems address ethical issues. To provide students with guidance for addressing these problems, a framework for ethical decision making is introduced in Chapter 1. The framework calls for students to

- Identify ethical problems as they arise.
- Objectively consider the well-being of others and society when exploring alternatives.
- Clarify and apply ethical values when choosing a course of action.
- Work toward ongoing improvement of personal and organizational ethics.

Suggested answers for each dilemma are provided on the instructor and student Web sites.

Shown is our ethical decision-making vignette from Chapter 6 (process costing including spoilage, rework, and scrap).



### FOCUS ON ETHICAL DECISION MAKING Cost Overruns at Boeing

During 2002, *The Boeing Company* settled, without admitting guilt, a securities fraud lawsuit. The lawsuit, which was settled for \$92.5 million, claimed that the company had improperly failed to report abnormal production losses on its income statement during the first half of 1997. The company's production had been out of control. The company's audit firm, Deloitte & Touche, notified the board of directors' audit committee that the company experienced negative trends during 1996 in "overtime, parts shortages, rework, defective parts, and out-of-sequence work" (Holmes and France, 2002, p. 213).

In most companies, production problems of this nature would have been reflected in inventory and then in cost of goods sold as units were sold. However, Boeing uses a practice called program accounting, a long-term standard costing system. Instead of assigning actual costs to each plane built, the company allocates an expected cost. Actual product costs are accumulated in a cost pool that is recorded as an asset. The asset is reduced for costs allocated to planes built. However, no adjustment is made each period for the amount of cost that has been underapplied or overapplied. Instead, the company depends on the reliability of its long-term cost estimates. Boeing uses this accounting method because it experiences a learning curve when it launches a new type of plane. The company expects higher production costs early in a program and lower production costs later. Thus, program accounting allows the company to allocate an average cost to planes throughout the life of a program.

As production problems grew, Boeing's managers estimated during May 1997 that total production costs would exceed estimates by \$1 billion. The lawsuit claimed that the abnormal costs should have been recognized during the second quarter of 1997, similar to the treatment for abnormal spoilage presented in this chapter. However, Boeing's lawyer argued that the costs were typical for periods in which production levels were unusually high and that costs were expected to even out over the life of the project (Holmes and France 2002). The company ultimately announced an abnormal production loss in October 1997, when production on two product lines was temporarily halted.

Why should it matter whether the loss was reported in May versus October of 1997? In August 1997, Boeing completed its acquisition of *McDonnell-Douglas* and paid through a stock swap. According to Holmes and France (2002), "If investors had understood the scope of the problems, the stock would probably have tumbled and the McDonnell deal—a stock swap that hinged on Boeing's ability to maintain a lofty share price—would have been jeopardized."

SOURCES: S. Holmes and M. France, "Boeing's Secret: Did the Aircraft Giant Exploit Accounting Rules to Conceal a Huge Factory Snafu?" *Business Week*, May 20, 2002, pp. 110-120; and Boeing Company Annual Report for the year ended December 31, 2002, available under Investor Relations at [www.boeing.com](http://www.boeing.com).

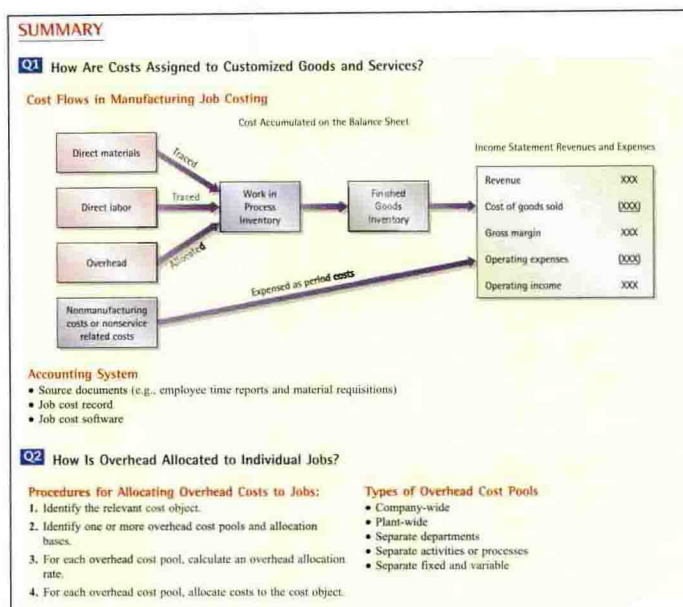
#### Practice Ethical Decision Making

In Chapter 1, we learned about a process for making ethical decisions (Exhibit 1.11). You can address the following questions for this ethical dilemma to improve your skills for making ethical decisions. Think about your answers to these questions and discuss them with others.

Ethical Decision-Making Process	Questions to Consider about This Ethical Dilemma
Identify ethical problems as they arise.	Was Boeing's delay in recognizing losses for its 777 program an ethical issue? Why or why not?
Objectively consider the well-being of others and society when exploring alternatives.	Describe a McDonnell-Douglas shareholder's viewpoint and a Boeing shareholder's viewpoint about whether Boeing should have recognized the losses earlier. What assumptions lie behind each viewpoint?
Clarify and apply ethical values when choosing a course of action.	When managers are faced with long-term uncertainties about their costs such as in this situation, what criteria should they use to decide how to report costs publicly? What values did you use to arrive at the solution?
Work toward ongoing improvement of personal and organizational ethics.	How might Boeing continuously improve its public reporting of product costs?

## Margin Notes

Several types of margin notes are used throughout each chapter to briefly present supplemental information and real-world examples. *Current Practice* and *International* notes present interesting examples of cost accounting concepts, methods, or issues for real organizations. *Alternative Terms* acquaint students with terminology they may encounter in the workplace, in other textbooks, or on professional examinations. *Chapter Reference* notes are used to help students locate expanded discussions of a topic that are presented elsewhere in the textbook. *Helpful Hints* provide students with suggestions to help them apply concepts or techniques.



## REVIEW

### Chapter Summary

The chapter Summary is organized using the Learning Objective questions presented at the beginning of the chapter and provides an overview of all key cost accounting methods and concepts. Thus, unlike traditional summaries, *the Summary in this text reviews both quantitative and qualitative content of the chapters*. It is a visual tool for students to use as an overview when they begin a chapter and as a review when they complete it.

### Self-Study Problems

Each chapter provides one or two self-study problems that address the most important content introduced in the chapter and are similar to end-of-chapter Exercises and Problems. Each Self-Study Problem is accompanied by a solution that guides students through the calculations and thinking processes.

## END-OF-CHAPTER ASSIGNMENT MATERIAL

The end-of-chapter material reinforces student learning of cost accounting techniques as well as helps them develop professional competencies such as analytical and decision-making skills.

### Questions

Short-answer Questions provide students with practice using the terminology and cost accounting techniques learned in the chapter.

### Exercises

Exercises focus primarily on ensuring that students learn to properly apply cost accounting methods.



## Problems

Problems give students additional practice using cost accounting techniques, and they also pose open-ended questions requiring judgment (e.g., identify uncertainties, analyze information, explore incentives and biases, evaluate alternatives, and recommend a course of action). The requirements support better performance by guiding students through the steps needed to fully address a problem, from less to more complex aspects. Following is an example from Chapter 3 (Cost-Volume-Profit Analysis). The Q3, Q4, and Q5 icons relate to three different learning objectives. The coding icons (e 1 2) are explained below.

239 CHAPTER 3 ► COST-VOLUME-PROFIT ANALYSIS

### PROBLEMS

**3.30** **Q3, Q4, Q5** **Sales mix, multiple product breakeven, uncertainties, quality of information** Keener produces two products: regular boomerangs and premium boomerangs. Last month 1,200 units of regular and 2,400 units of premium were produced and sold. Average prices and costs per unit for the month are displayed here.

	Regular	Premium
Selling price	\$22.15	\$45.30
Variable costs	4.31	6.91
Product line fixed costs	8.17	24.92
Corporate fixed costs	5.62	5.62
Operating Profit	\$ 4.05	\$ 7.85

Product line fixed costs can be avoided if the product line is dropped. Corporate fixed costs can be avoided only if the firm goes out of business entirely. You may want to use a spreadsheet to perform calculations.

**REQUIRED:**

- Assuming the sales mix remains constant, how many units of premium will be sold each time a unit of regular is sold?
- What are the total fixed product line costs for each product?
- What are the total corporate fixed costs?
- What is the overall corporate breakeven in total revenue and for each product, assuming the sales mix is the same as last month's?
- What is the breakeven in revenues for regular boomerangs, ignoring corporate fixed costs?
- Why is the breakeven for regular boomerangs different when we calculate the individual product breakeven versus the combined product breakeven?
- When managers monitor the profitability of regular boomerangs, are corporate fixed costs relevant? Explain.
- CVP analysis assumes that the sales mix will remain constant. Explain why managers generally cannot know for certain what their sales mix will be.
- What is the effect of uncertainty about the sales mix on the quality of the information obtained from CVP analyses?

## Exercise and Problem Types, Codes, and Icons

A number of codes and icons are used in the end-of-chapter materials to make it easier for instructors to select homework assignments and to enhance student learning.

**Q3, Q4, Q5, Q6 Learning Objectives.** Each Exercise and Problem is keyed to one or more Learning Objective questions.

**e 1 2 3 4 Complexity Coding.** Students often have difficulty answering open-ended questions, and instructors feel frustrated because they do not understand students' inability to respond. In this book, icons help instructors choose appropriate Exercises and Problems for their syllabi, and they help students recognize how to approach a particular homework question.

- Individual questions having single correct answers are not labeled.
- Questions having a single correct answer, but asking students to stretch their knowledge to a new type of situation not addressed in the chapter, are marked with an Extend icon (e).
- Open-ended questions are labeled with an icon for the required skill level in *Steps for Better Thinking* (1, 2, 3, 4).