fourth edition

MANAGEMENT ACCOUNTING

A DECISION EMPHASIS

Don T. DeCoster
Eldon L. Schafer
Mary T. Ziebell

fourth edition

MANAGEMENT ACCOUNTING
A DECISION EMPHASIS

Don T. DeCoster

Seattle University, Seattle

Eldon L. Schafer

Pacific Lutheran University, Tacoma

Mary T. Ziebell

Seattle University, Seattle

John Wiley & Sons

New York Chichester Brisbane Toronto Singapore

Library of Congress Cataloging in Publication Data:

DeCoster, Don T.
Management accounting.
Bibliography: p.
1. Managerial accounting. 2. Decision-making
I. Schäfer, Eldon L. II. Ziebell, Mary T.
III. Title.
HF5657.4.D43 1988 658.1'511 87-29427
ISBN 0-471-63713-0

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

about the authors

DON T. DeCOSTER, Ph. D., C.P.A., is Professor of Accounting at Seattle University in Seattle. He holds a Ph.D. in Business Administration from The University of Texas and a Ph.D. in Counseling Psychology from the University of Oregon. He wrote, with William J. Bruns, Jr., *Accounting and Its Behavioral Implications* and with Kavasseri V. Ramanathan and Gary L. Sundem, *Accounting for Managerial Decision Making*. He has published articles in *The Accounting Review, The Journal of Accounting Research, Cost and Management, The Journal of Accountancy, Business Budgeting, The Journal of Vocational Behavior,* and other professional journals. Teaching interests include management accounting and cost accounting at both the graduate and undergraduate level. He has served as both Editor of the Educational Research Section of *The Accounting Review* and Editor of *The Accounting Review*. Research interests focus on the interactions of human beings with the accounting function.

ELDON L. SCHAFER, Ph.D., C.P.A., is Professor of Accounting at Pacific Lutheran University in Tacoma, Washington. He holds a Ph.D. in Business Organization and Management from the University of Nebraska. He taught previously at the University of Washington, Syracuse University, San Jose State University, and the University of Nebraska. A member of the American Accounting Association, the Washington Society of Certified Public Accountants, and the National Association of Accountants, he has been active in professional development programs in management accounting throughout the United States. He has been engaged in research and writing on financial management of ambulatory health care organizations under a grant from the Center for Research in Ambulatory Health Care Administration.

MARY T. ZIEBELL, Ph.D., is Associate Professor of Accounting at Seattle University in Seattle. She holds a Ph.D. in Business Administration from the University of Washington. She has published articles in *Health Care Management* and *The Women's C.P.A.* A member of the American Accounting Association and the American Society of Women Accountants, she has also been active at both the local and national level of Beta Alpha Psi, the national accounting fraternity. She has served on a number of Boards of Directors in the health-care field, engaged in the development of professional health care programs and drawn many of her cases from this area which have been printed in accounting and marketing textbooks. Her teaching and research interests are focused on management and cost accounting and management control systems in public service organizations.

preface

This book is an introductory text in management accounting. We assume that students have had an introduction to the basic accounting process of measuring and summarizing business transactions and preparing financial statements. While it is not necessary that previous exposure to accounting theory and practice be extremely rigorous, it is important for the student to have been exposed to the accounting cycle, including journal entries.

It is our goal to take the student as deeply into management accounting theory and practice as feasible within the constraints of a one-quarter or one-semester course. To accomplish this goal we have adopted a number of pedagogical goals. First the organization of this book focuses the student's attention on the primary purpose of management accounting data, decisions by management, as contrasted with external reporting.

Second, the textual material is presented in a thematic form. The backbone of the theme is decision making and the flesh is the role of extant or possible accounting systems in providing relevant data. In this sense the book can be viewed as both normative and real world-oriented.

Third, when material is presented we try to provide both the theory and the technique. In many cases this makes the coverage more complete and involved than in other texts.

Fourth, we have included accounting theory, economic theory, quantitative methods, and organizational theory as appropriate. No attempt has been made to make this a "traditional" record keeping book, or a "quantitative" book, or a "behavioral" book. Rather, necessary tools and techniques have been covered when they blend into the overall theme of management accounting for decision making.

Fifth, we have tried to keep the content and explanations clear and understandable without sacrificing depth. To assist in the students' understanding there are many problems at the end of each chapter. We believe that the students will find these problems challenging and that their ability to handle "real-world" settings will be significantly advanced by their active participation in the problem solving. Some problems are basic; some require considerable thought and effort; some have a range of suitable approaches; some compound and integrate previous material. There are some "teaching" problems where the content pushes beyond the text. Finally, we have included teaching cases for those applications where the instructor wants to take the student beyond problem solving into complex, real-world settings where the solutions are judgmental as well as numerical.

CONTENT OF THIS EDITION

Part One is entitled "Accounting Data for Decision Making." Its three chapters introduce the student to the decision process by discussing the planning and control process and the role of fixed and variable costs in decision making.

Chapter 1, "The Planning and Control Process for Decision Making," sets the stage by providing a planning and control framework through a review of the nature of the decision process and the types of decisions that business management must make.

Chapter 2, "Determining Cost Behavior Patterns," includes definitions of fixed and variable costs and a detailed discussion of the methods accountants use to measure and evaluate cost behavior patterns.

Chapter 3, "Cost-Volume-Profit Interaction for Operating Decisions," discusses the role of fixed and variable costs in decision making by focusing on the breakeven point and the contribution margin.

The second part is entitled "Variable Costing Systems." Its three chapters introduce the student to the accounting methodologies of data gathering and selection. These chapters represent a departure from the more traditional textbook presentation. Because it is generally accepted among management accountants that variable costing is preferred for management decision making, these chapters emphasize variable costing for data collection. The instructor is spared the embarrassing position of first teaching absorption costing and then having to say "this is a less valuable system for decision making than variable costing, which we haven't emphasized."

Chapter 4, "Cost Flows for Product Costing," has two purposes. Beginning with the distinction between product and period costs, it serves the traditional role of giving the student the accounting terminology needed. Second, the chapter discusses the differences between variable and absorption costing and their strengths and weaknesses.

Chapter 5, "Variable Job Order and Process Costing Systems," concentrates on how historical accounting creates the flow of costs necessary for measuring production costs. Both job order and process costing are illustrated using variable costing.

Chapter 6, "Variable Standard Costing for Cost Efficiency," introduces standard cost systems. Emphasis is placed on setting standards, operating a standard cost system, and understanding variable standard cost variances.

Part Three is entitled "Absorption Costing Systems and Cost Allocations." There are two chapters in this section.

Chapter 7, "Overhead and Absorption Costing," introduces the problems of fixed overhead costs in absorption costing. Special emphasis is placed on predetermined overhead rates for absorption costing and the analysis of overhead variances. A comparison of variable and absorption standard costing summarizes the chapter. In the chapter appendix the methodology of converting a variable costing system to an absorption costing system is explained and demonstrated.

Chapter 8, "The Allocation of Indirect Costs," shows how indirect costs are allocated between products and departments in both manufacturing and nonmanufacturing settings. An Appendix to the chapter illustrates how reciprocal allocations can be used.

Part Four is entitled "The Use of Data in Making Decisions." The three chapters in this section focus on the data needed for both short-range and long-range decisions.

Chapter 9, "Revenue and Pricing Decisions," contains a discussion of both economic and accounting approaches to pricing decisions. There is also coverage of governmental "cost-based" pricing.

Chapter 10, "Relevant Costs and Production Decisions," covers a number of short-range decisions that affect production output and costs including make or buy, sell or process, and linear programming. The chapter also includes coverage of inventory control methods.

Chapter 11, "Long-range Decisions," introduces long-range decisions. After a discussion of the measurement of costs and benefits for long-range decisions, both discounted cash flow methods and techniques that do not use the time value of money are explained. ACRS is used as the example of how income taxes can affect the cash flows. The chapter closes with an illustration of how discounted cash flow methods can be used to cope with inflation.

Part Five, "Planning and Control Systems for Decision Implementation," uses the budgetary process to show how the integration of decision data can be grouped into a meaningful, coordinated package.

Chapter 12, "Budgeting: A Systematic Approach to Planning," has been rewritten. Using a simple example, this chapter shows how the sales forecast is converted into sales and production budgets for both quantities and costs, culminating in the Profit Plan. Next the Cash Budget and the Statement of Financial Position are shown. Finally, end-of-the-period performance reports are shown using both the Profit Plan and the flexible budget.

Chapter 13, "Responsibility Accounting and Budgetary Control," takes a different approach from chapter 12. Here the focus is on how the budgeting process can be accomplished through responsibility centers. Emphasis is placed on relating the budgetary process to the reporting system necessary to achieve good responsibility accounting.

Chapter 14, "Measurement of Divisional Performance," deals with problems that are unique to larger, decentralized organizations. Problems discussed are divisionalization, divisional profit measurement, intercompany transfer pricing, and divisional rates of return.

Overall, the revisions in this Fourth Edition should provide for a systematic and logical coverage of management accounting. Some chapters, notably Chapters 6, 7, 8, 11, 12, and 13, have been substantially rewritten. There are also other major changes such as strengthening the statistical methods in a Chapter 2 Appendix, the addition of material on the learning curve in an Appendix to Chapter 6, and the movement of the conversion from variable to absorption costing to an Appendix at the end of Chapter 7. We believe that

these changes will make the text material flow smoothly for the student without sacrificing breadth or depth.

We have also made substantial changes in the problem materials. Each chapter now has a large number of problems ranging from the very simple to the complex. With careful use of the problem assignments, it is possible for an instructor to teach a very straightforward course for the sophomore or a more complex course for the M.B.A. The problem materials are also diverse in their settings: There are manufacturing, service, retail, profit-oriented, nonprofit, and governmental and personal settings.

We have been encouraged and supported in our writing by many people. We would like to offer a special word of thanks to our colleagues and friends who have read and commented on the manuscript:

Michael F. Thomas, Oklahoma State University; Wayne G. Bremser, Villanova University; David P. Franz, San Francisco State University; John H. Salter, University of Central Florida; Richard Arvey, Seattle University; Jack O. Hall, Jr., Western Kentucky University; Douglas A. Johnson, Arizona State University; John A. Dettman, University of Minnesota-Duluth, Bobbe Barnes, University of Texas.

Each of these reviewers made valuable comments and suggestions. We have given serious consideration to each suggestion, and we believe their efforts strengthened the manuscript. Of course, we must take full responsibility for the text.

We are also indebted to the American Institute of Certified Public Accountants, the National Association of Accountants, the Institute of Certified Management Accountants, the Society of Industrial Accountants of Canada, and many publishers and companies for their permission to quote from their publications and examinations. Problems from the Uniform CPA Examinations are designated *CPA adapted*; problems from the examinations administered by the Society of Industrial Accounts are designated *Canada SIA adapted*; and problems from the Certified Management Accountant examination given by the Institute of Certified Management Accountants are designated *CMA adapted*.

The authors and the publisher welcome comments from users.

Don T. DeCoster
Eldon L. Schafer
Mary T. Ziebell

contents

part 1

ACCOUNTING DATA FOR DECISION MAKING

chapter 1

THE PLANNING AND CONTROL PROCESS FOR DECISION MAKING

The primary purpose of an economic system is to satisfy the wants and needs of its members by generating and allocating resources. In the not-for-profit segment of the economy, particularly governmental entities, the plans for resource allocation are made through the budgetary process. The legislative and executive branches decide what resources will be used for national defense,

maintenance of law and order, and recreational and park activities, among others. Once these needs have been determined and budgeted, taxes are levied to support them. It is through the collection of taxes and subsequent governmental expenditures that economic resources are allocated in the public sector.

The decisions of investors and business managers allocate resources in the profit-oriented segment of the economy. Business resource allocations take place at two levels. First, and most visible, are interfirm decisions made in the capital markets, such as the stock and bond exchanges. The flow of resources between firms is determined in part by these markets. Investors commit their resources (funds) to those firms where they believe they can earn an acceptable rate of return on their investment.[1] Second, and less visible, are intrafirm decisions. Once resources have been invested in a firm, its managers must make decisions about how best to use them to earn a satisfactory rate of return.

The role of accounting is to provide meaningful information for both of these resource allocation decisions. In the broadest sense, accounting is a vehicle for communicating the data necessary for making intelligent economic decisions.

THE ROLE OF ACCOUNTING IN DECISION MAKING

Because accounting provides a data base for both interfirm and intrafirm decisions, it is logical to assume that accounting data must be multipurpose. The focus of accounting data for *interfirm* resource allocations is termed **financial accounting.** The focus of accounting data for *intrafirm* allocations through the planning and control process is termed **management accounting.** There is much common ground between financial and management accounting. There are, however, important differences in both data requirements and philosophical approaches to these data.

INTERFIRM ALLOCATION DECISIONS

Financial accounting data serve two distinct purposes. First, these data serve as an information source for investors and creditors making their investing and lending decisions. Financial reports (Statement of Financial Position, Income Statement, Statement of Retained Earnings, and Statement of Changes in Financial Position) are used by prudent investors in selecting investments. They provide clues to the financial security and stability of a firm and point toward the possible results of future operations. Second, for society at large, financial

[1]Rate of return on investment is measured by: Income ÷ Investment. A discussion of rate of return for performance evaluation will be found in Chapter 14; the role of the rate of return on asset additions is discussed in Chapter 11.

data are used to ensure that a firm has complied with societal regulations and laws.

When financial accounting data are made available to the public, certain requirements are imposed. First, the users, whether they are stockholders, bondholders, or governmental agencies, typically use these data in their decision-making activities without access to the detailed transactions that are the basis of the summary reports. They must have assurance of a fair and objective presentation of facts. The independent auditor (Certified Public Accountant) serves the function of attesting to the general fairness of the data.

Second, because the financial data serve many diverse interests and people, there is a need for uniformity and standardization. This need has generated many accounting activities seeking to develop a common base of knowledge and, hence, communication. For example, the Financial Accounting Standards Board seeks to develop a common theory of identifying, measuring, and reporting financial and economic events to the public.

INTRAFIRM ALLOCATION DECISIONS

Intrafirm operating decisions begin when resources have been committed to the firm. The goal of management accounting is to provide the information necessary to facilitate management's choices about how to optimize the use of these financial resources. The data demands of the manager are more specific than the data demands of the investor. There must be allocations between products, asset structures, territories, departments, and management responsibility centers.[2] The nature of a specific decision is often well defined so that the data can be pinpointed and decision rules developed. It should be pointed out that it may be relatively simple to determine what data are needed for a decision. This does not mean, however, that the gathering of this information is simple or easy. It may be difficult, and at times impossible, to isolate the data necessary for a particular decision. But management has one advantage that people outside the firm may not have. With access to the sources of events, management can modify the accounting system and reports to meet its unique specifications. This accessibility makes the data flexible and allows the development of specific data for specific decisions.

This text emphasizes management accounting, that is, information that management needs to make specific intrafirm resource allocations. Such emphasis assumes that accounting must perform the two separate, distinct functions of financial and management reporting and that the data needs for each are often different. However, there are common threads that run through both financial

---

[2]We will use the term *responsibility center* a few times in a general sense before we give a detailed definition. A responsibility center is an organizational unit where there is specific managerial responsibility for a specific activity and, therefore, for the related costs, revenues, and/or resources.

and management accounting. Moreover, the societal and legal requirements of financial accounting often act to limit the flexibility of management accounting.

THE PLANNING STAGE

Business owners and managers cannot avoid making decisions, even if the decision is to do nothing. They must choose whether to focus their decision making toward specific goals or merely to react to events as they take place. Without goals, and without data about these goals, decisions will lack purpose. A good management decision will be both effective and efficient. An **effective** decision accomplishes the goals management seeks. An **efficient** decision consumes the minimum amount of resources necessary to achieve the goal.

The following section discusses the nature of business decisions. Three assumptions are implicit in this discussion. First, it is assumed that the firm has scarce, but unallocated, resources at its disposal. These resources may be financial, such as cash; physical, such as material, equipment, and buildings; or human, such as the time, skill, and energy of people. Second, it is assumed that management desires to make decisions about how to use these resources in an effective and efficient way. Third, it is assumed that the planning process can be generalized and applied to all types of economic entities. Each firm or organization will approach the steps in the process somewhat differently, but we can isolate and study the common thread running through the planning process. Exhibit 1–1 provides a generalized overview of the planning and decision process.

The first step in making a decision is **planning,** which involves the selection of enterprise goals and the development of programs to allocate resources to achieve these goals. Planning is the backbone of effective decision making. It is through the planning process that management formulates courses of action that reduce uncertainty about the future and assimilate the many pressures that bear on the firm.

The planning process may be formal or informal. Formal planning is generally superior to informal planning, but informal planning is better than no planning at all. Formal planning should begin with the development of the firm's goals and a recognition of the individual and societal limitations the firm faces in accomplishing its goals.

ORGANIZATIONAL GOALS

Before there can be purposeful decisions, there must be a goal—a direction. The goal is the basic aim of the decision maker. In capitalistic countries such as the United States and Canada, it is generally held that business activity has the common goal of making a profit. Springing from traditional economic the-

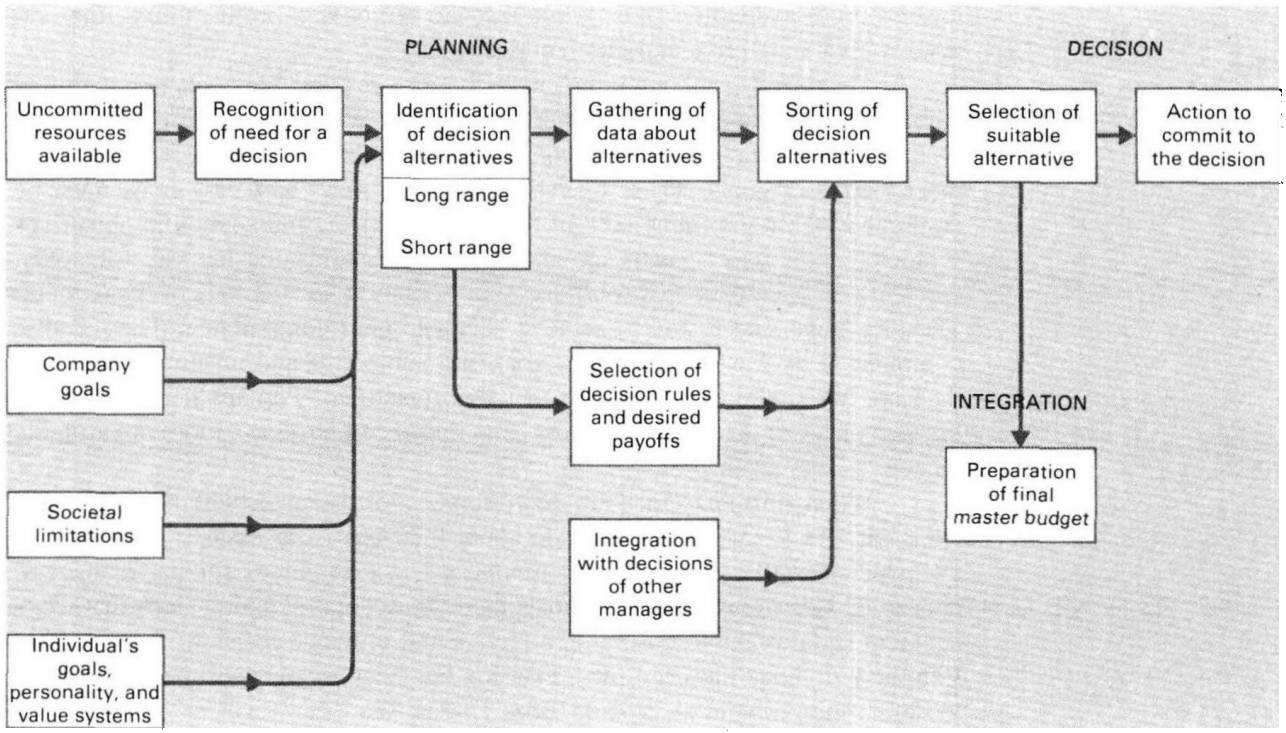

EXHIBIT 1–1 The planning and decision process

ory, this fundamental goal is often stated directly. At other times the profit goal is implied within broader statements such as "providing a public service" or "providing for the long-run existence of the firm." The assumption is that if a firm provides a useful, sought-after service, it will receive a fair price and profits will result. Similarly, the long-run existence of a firm is assured if it can continue to provide a desired service with an acceptable profit. Certainly, the common element that links all business firms, from the smallest to the largest, is the profit motive.

It would be too simplistic to say that the *only* goal of a business firm is to *maximize* profits. There are many goals other than profit. Some managers seek to establish a power base and build an empire. Others seek social prestige and peer-group or public approval. Another goal is security. The removal of uncertainty or ambiguity about the future can often override the pure profit motive. Finally, many individuals and firms have humanitarian goals. Hiring disabled workers, maintaining a clean environment, and providing an enjoyable place to work are examples of humanitarian goals.

Not all enterprises have a profit motive. The federal and state governments; charitable organizations such as the Red Cross, the Salvation Army, and the Good Neighbor Funds; and community service activities such as hospitals, art museums, and symphony orchestras do not have a profit motive. The goals of these not-for-profit organizations are to provide the maximum services within

the resources available. Thus, while they do not have a profit motive, they do need to make effective and efficient decisions.

The problems of combining many diverse yet separate goals into a unified whole should be apparent. Within the overriding requirement that the firm earn a satisfactory profit to maintain its existence, managers and workers strive to meet their own goals. These owners', managers', and workers' goals must be combined within the framework of the legal, political, and economic objectives of society. Unless managers are successful in blending the majority of goals, the firm will operate at cross purposes with society or the workers or the owners. The firm must find a way to achieve adequate **goal congruence.** This need is complicated by the fact that most goals are subjective and unspoken. Further, they are broad and rarely capable of being quantified. Perhaps it is because of the vagueness of many goals that decision makers emphasize a more quantifiable objective—the profit motive.

When a firm has uncommitted resources, or resources that may be shifted from one use to another, a decision about their use is necessary. The goals of the firm, as well as any external limitations, act as guides for the managers' decisions. Beginning with these goals there are several planning steps that management should take to ensure an effective and efficient decision. As shown in Exhibit 1–1, once the need for a decision has been recognized the next step is to define the problem and list decision alternatives.

TYPES OF DECISIONS

Some decisions call for the commitment of company resources to plant and equipment. Usually these decisions are termed **long-range** or **capacity decisions.** Long-range decisions have two unique characteristics. First, they involve changes in the productive or service potential of the firm. Second, and equally important, they cover a relatively long time span, so their effect on the firm is best measured in terms of cash flow, adjusted for the time value of money. The **time value of money** is a formal recognition of the simple fact that a dollar invested today will earn a return and be worth more later. Conversely, a dollar to be received in the future in worth less today.

Decisions involving production output, competitive pricing, additions to the product line, and temporary shutdown are **short-range** or **operating decisions.** Each of these decisions spans a short enough time period so the time value of money is not considered significant, although it is present. Further, none involves adding to or reducing production facilities; rather, they involve obtaining the best results possible from existing facilities or resources.

BENEFITS AND COSTS RELEVANT TO DECISIONS

As shown in Exhibit 1–1, after the decision alternatives have been identified, the next step in the planning process is the development of data on benefits and