

Third Edition

CONTEMPORARY
ISSUES IN
COST AND MANAGERIAL
ACCOUNTING

A Discipline in Transition



Anton · Firmin
Grove

**Contemporary
Issues in
Cost and Managerial
Accounting**

. . .

A Discipline in Transition

Third Edition



Edited by

Hector R. Anton
University of California, Berkeley

Peter A. Firmin
University of Denver

Hugh D. Grove
University of Denver

HOUGHTON MIFFLIN COMPANY · BOSTON
Dallas · Geneva, Illinois · Hopewell, New Jersey · Palo Alto · London

***To Our Wives —
Lois, Jean, and Nancy***

Copyright © 1978 by Houghton Mifflin Company. Two previous editions were published under the title Contemporary Issues in Cost Accounting: A Discipline in Transition. The selections reprinted in this book are used by permission of and special arrangement with the proprietors of their respective copyrights. All rights reserved. No part of this work may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or by any information storage or retrieval system, without permission in writing from the publisher.

Printed in the U.S.A.

Library of Congress Catalog Card Number: 77-074383

ISBN: 0-395-25435-3

**Contemporary
Issues in
Cost and Managerial
Accounting**

Contributors

AMERICAN ACCOUNTING ASSOCIATION COMMITTEE ON HUMAN RESOURCE ACCOUNTING

MEMBERS: ROGER H. HERMANSON, CHAIRMAN, *Georgia State University*
R. LEE BRUMMET, *University of North Carolina at Chapel Hill*
NABIL ELIAS, *University of Manitoba*
ERIC G. FLAMHOLTZ, *University of California, Los Angeles*
ROBERT R. IRISH, *University of Toledo*
CARL G. KRETSCHMAR, *University of South Carolina*
GARY A. LUOMA, *Emory University*
JOSHUA RONEN, *New York University*
MICHAEL J. VERTIGAN, *University of Alberta*

AMERICAN ACCOUNTING ASSOCIATION COMMITTEE ON MANAGERIAL DECISION MODELS

MEMBERS: CHARLES T. HORNGREN, CHAIRMAN, *Stanford University*
HECTOR R. ANTON, *Haskins and Sells, New York, and Professor Emeritus, University of California, Berkeley*
HAROLD BIERMAN, JR., *Cornell University*
EUGENE H. BROOKS, JR., *University of North Carolina at Chapel Hill*
PETER A. FIRMIN, *University of Denver*
ELLSWORTH MORSE, JR., *U.S. General Accounting Office*
THOMAS H. WILLIAMS, *University of Texas at Austin*
ZENON ZANNETOS, *Massachusetts Institute of Technology*

RUSSELL L. ACKOFF
University of Pennsylvania

JOHN V. BAUMLER
Ohio State University

GEORGE J. BENSTON
University of Rochester

JACOB G. BIRNBERG
University of Pittsburgh

EDWIN H. CAPLAN
University of New Mexico

ABRAHAM CHARNES
University of Texas at Austin

W. W. COOPER
Harvard University

JOEL DEMSKI
Stanford University

NICHOLAS DOPUCH
University of Chicago

THOMAS R. DYCKMAN
Cornell University

NATWAR M. GANDHI
University of Pittsburgh

LAWRENCE A. GORDON
University of Kansas

HUGH D. GROVE
University of Denver

DAVID B. HERTZ
McKinsey & Company, Inc., New York

CHARLES T. HORNGREN
Stanford University

YUJI IJIRI
Carnegie-Mellon University

JEFFREY E. JARRETT
University of Rhode Island

ROBERT S. KAPLAN
Carnegie-Mellon University

JAMES C. KINARD
Ohio State University

ROBERT A. KNAPP
General Electric, Johnson City, New York

JAMES S. LABICK
Arthur Andersen & Company, New York

FERDINAND K. LEVY
Georgia Institute of Technology

JOHN L. LIVINGSTONE
Georgia Institute of Technology

DANNY MILLER
McGill University

WAYNE J. MORSE
Duke University

E. W. NETTEN
Price Waterhouse & Company

MOHAMED ONSI
Syracuse University

PETER A. PYHRR
Texas Instruments Incorporated

JOSHUA RONEN
New York University

JAMES E. SORESENSEN
University of Denver

GARY L. SUNDEM
University of Washington

FRANK C. SURGES
Fidelity Union Trust Company, Newark, New Jersey

GERALD L. THOMPSON
Carnegie-Mellon University

DOUGLAS VICKERS
University of Western Australia

DAVID J. H. WATSON
University of Queensland

H. MARTIN WEINGARTNER
University of Rochester

JEROME D. WIEST
Rice University

Preface

The theme of the third edition of our cost and managerial accounting readings book is a familiar one: a discipline in transition. The readings again reflect behavioral-science, information-system, and quantitative-method analyses of cost and managerial accounting problems. The final section of the book further develops emerging trends, information system design, human resource accounting, social accounting, and operational not-for-profit performance evaluation techniques.

Increasing concern for efficiency and public accountability in the not-for-profit sector of the economy makes the concepts and techniques of managerial accounting quite relevant to public administration, management, and social work.

We have attempted to include articles that reflect the "frontier" of existing knowledge in the cost and managerial accounting disciplines. The articles cover such "frontier" issues as: using zero-base budgeting techniques to justify an organization's existence; using expectancy theory to analyze behavioral impacts on budgeting; tracking cost variances with cusum charts; applying standard costs to a service industry (for example, incorporating them into a bank's information system); using organization theory to solve the transfer pricing problem of decentralized entities; and linking non-monetary outcome measurements to costs in an interdisciplinary perspective to provide nonprofit performance evaluations.

The articles appear in the following seven-part sequence: a perspective in managerial accounting; forecasting, budgeting, and responsibility accounting; capital budgeting; cost estimation and cost-volume-profit analysis; standard costs and performance evaluation; cost allocation and decentralization; and emerging areas in managerial accounting. The perspective developed in Part One considers information system, decision model, and behavioral science concepts. Within this perspective we will view the specific managerial accounting topics covered in Parts Two through Six. The emerging areas in Part Seven reflect the extension of these concepts in recent cost and managerial accounting developments.

The thirty articles in this book reflect various degrees of quantitative application ranging from a mere mention of method to the development or application of specific quantitative techniques. In selecting the latter type of article, we have chosen, as much as possible, "self-contained" articles with sufficient explanations of quantitative techniques that the reader will not have to consult other sources. The degree of self-containment depends upon the background of the reader, however, and some may wish to study certain quantitative techniques in greater depth. A list of such supplemental sources, keyed to various articles used in the text, is given in the Appendix.

The editors again extend their gratitude to the authors of the articles included and to the publishers who kindly consented to allow the reprints.

We appreciate the special contribution of Barbara Wihera and Joyce Frakes, graduate students who participated in the literature review and helped select the articles from their unique and crucial point of view: usefulness and accessibility to the student. We also express our appreciation to Robert Hamilton, of the University of Minnesota, and Roger Roemmich, of the University of Georgia, who reviewed the original manuscript and made valuable comments.

H.R.A.

P.A.F.

H.D.G.

**Contemporary
Issues in
Cost and Managerial
Accounting**

Contents

<i>Preface</i>	<i>xi</i>
----------------	-----------

. . .

Part One

A PERSPECTIVE IN MANAGERIAL ACCOUNTING	1
1. Choosing Accounting Practices for Reporting to Management <i>Charles T. Horngren</i>	3
2. Report of Committee on Managerial Decision Models <i>American Accounting Association</i>	21
3. The Role of the Firm's Accounting System for Motivation <i>George J. Benston</i>	47
4. Behavioral Assumptions of Management Accounting <i>Edwin H. Caplan</i>	59
SUPPLEMENTAL READINGS TO PART ONE	78
ADDITIONAL BIBLIOGRAPHY TO PART ONE	82

Part Two

FORECASTING, BUDGETING, AND RESPONSIBILITY ACCOUNTING	85
5. Forecasting and Measuring with Correlation Analysis <i>Robert A. Knapp</i>	87
6. Zero-Base Budgeting <i>Peter A. Pyhrr</i>	101
7. An Expectancy Theory Approach to the Motivational Impacts of Budgets <i>J. Ronen and J. L. Livingstone</i>	118
8. The ABC's of the Critical Path Method <i>Ferdinand K. Levy, Gerald L. Thompson, and Jerome D. Wiest</i>	139
9. Responsibility Accounting for Better Management <i>E. W. Netten</i>	156
SUPPLEMENTAL READINGS TO PART TWO	165
ADDITIONAL BIBLIOGRAPHY TO PART TWO	167

Part Three

CAPITAL BUDGETING	170
10. Risk Analysis in Capital Investment	
<i>David B. Hertz</i>	172
11. Some New Views on the Payback Period and Capital Budgeting Decisions	
<i>H. Martin Weingartner</i>	189
12. Evaluating Simplified Capital Budgeting Models Using a Time-State Preference Metric	
<i>Gary L. Sundem</i>	207
13. The Discounted Cash Flow Investment Decision Model with Accounting Income Constraints	
<i>Thomas R. Dyckman and James C. Kinard</i>	228
SUPPLEMENTAL READINGS TO PART THREE	244
ADDITIONAL BIBLIOGRAPHY TO PART THREE	247

Part Four

COST ESTIMATION AND COST-VOLUME-PROFIT ANALYSIS	249
14. Multiple Regression Analysis of Cost Behavior	
<i>George J. Benston</i>	251
15. On the Economics of Break-Even	
<i>Douglas Vickers</i>	272
16. Breakeven Budgeting and Programming to Goals	
<i>A. Charnes, W. W. Cooper, and Y. Ijiri</i>	283
17. An Approach to Cost-Volume-Profit Analysis Under Uncertainty	
<i>Jeffrey E. Jarrett</i>	311
SUPPLEMENTAL READINGS TO PART FOUR	326
ADDITIONAL BIBLIOGRAPHY TO PART FOUR	329

Part Five

STANDARD COSTS AND PERFORMANCE EVALUATION	331
18. A Contribution Margin Approach to the Analysis of Capacity Utilization	
<i>Charles T. Horngren</i>	333

19. An Extension of Standard Cost Variance Analysis	
<i>Nicholas Dopuch, Jacob G. Birnberg, and Joel Demski</i>	349
20. The Significance and Investigation of Cost Variances: Survey and Extensions	
<i>Robert S. Kaplan</i>	363
21. Standard Cost Accounting for Banks	
<i>James S. Labick and Frank C. Surges</i>	392
SUPPLEMENTAL READINGS TO PART FIVE	417
ADDITIONAL BIBLIOGRAPHY TO PART FIVE	420

Part Six

COST ALLOCATION AND DECENTRALIZATION	422
22. Input-Output Analysis for Cost Accounting, Planning and Control	
<i>John Leslie Livingstone</i>	424
23. Reporting Production Costs That Follow the Learning Curve Phenomenon	
<i>Wayne J. Morse</i>	447
24. A Transfer Pricing System Based on Opportunity Cost	
<i>Mohamed Onsi</i>	467
25. Transfer Pricing: A Behavioral Context	
<i>David J. H. Watson and John V. Baumler</i>	479
SUPPLEMENTAL READINGS TO PART SIX	491
ADDITIONAL BIBLIOGRAPHY TO PART SIX	496

Part Seven

EMERGING AREAS IN MANAGERIAL ACCOUNTING	500
26. Management Misinformation Systems	
<i>Russell L. Ackoff</i>	502
27. A Contingency Framework for the Design of Accounting Information Systems	
<i>Lawrence A. Gordon and Danny Miller</i>	514
28. Report of The Committee on Human Resource Accounting	
<i>American Accounting Association</i>	532

29. Toward Defining the Accountant's Role in the Evaluation of Social Programs	
<i>Jacob G. Birnberg and Natwar M. Gandhi</i>	555
30. Cost-Outcome and Cost-Effectiveness Analysis: Emerging Nonprofit Performance Evaluation Techniques	
<i>James E. Sorensen and Hugh Grove</i>	565
SUPPLEMENTAL READINGS TO PART SEVEN	589
ADDITIONAL BIBLIOGRAPHY TO PART SEVEN	592
APPENDIX	596

PART ONE

A Perspective in Managerial Accounting

Cost and managerial accounting, like accounting in general, are dynamic, evolving disciplines. Traditional cost accounting has dealt largely with the accumulation and allocation of factory costs and product for inventory valuation and income determination. The discipline is now more generally designated as managerial accounting to emphasize its conceptual expansion in order to provide relevant accounting data to decision-makers. These conceptual developments include the consideration of management information systems, decision models, behavioral science, budgeting, cost estimation and control, not-for-profit performance evaluation, internal pricing, and various decision-oriented problem areas. Part One introduces the general development and integration of management information systems, decision models, and behavioral science in the managerial accounting discipline.

Horngren outlines the scope, content, and method of management accounting in a management information system context. He distinguishes financial accounting from “. . . internal reporting for managers for planning, controlling current operations . . . [and] for making special decisions and formulating long-range plans.” He also develops objectives and informational requirements for decision-makers. Although it stresses management accounting, the Horngren article applies equally to not-for-profit organizations. Indeed, cost and management accounting are increasingly being recognized as relevant to hospitals, government, and other fiduciary organizations. Horngren also foresees many later developments such as decision analysis, divisional reporting problems, and flexible organizational systems for the managerial accounting discipline.

In providing relevant information to decision-makers, managerial accounting starts with the examination of actual decision models that indicate specific types of desired accounting information. The “Report of the

Committee on Managerial Decision Models” of the American Accounting Association develops the investigation of various decision models and interactions with accounting and information systems. The report begins with an exploration of the general nature of decision models and general attributes of information for decision models. It then elaborates implications of decision models and information systems for managerial accounting. Finally, the report explores specific decision models to develop the types of information desired. With a cost-benefit perspective, the reader may then assess the difference between information traditionally provided by managerial accounting and that which should be provided.

Another major development in managerial accounting has been the long overdue recognition of the great impact of the behavioral sciences on accounting. This impact has been reflected in extensive non-accounting literature in the areas of motivation, behavior, and organizational theory. Benston provides a good survey of the literature and applies these concepts to accounting systems. As one of the earlier articles on behavior and accounting, it serves as an introduction to the area.

Caplan then expands the role of behavioral science in managerial accounting by specifying and comparing behavioral assumptions from the classical and modern behavioral viewpoints. The design of the management and accounting information systems depends heavily on which viewpoint management follows. If the modern behavioral viewpoint predominates, then the traditional accounting information system, which corresponds to the classical behavioral viewpoint, must also evolve into a modern system to provide relevant information. The differences between the two behavioral schools of thought are elaborated in four categories of assumptions — organization goals, participant behavior, management behavior, and the role of management accounting. The challenging implication is that traditional managerial accounting systems may be mismatched with modern behavioral viewpoints and information requirements.

1 *The scope and content of financial accounting is well known. In this article the author defines the scope of managerial accounting and contrasts it with financial accounting. The objectives of management accounting and the types of information requirements are clearly outlined.*

The main purposes are given as routine reporting of financial data or "score-keeping"; routine reporting to management for planning and control or "attention-directing"; and special reporting to management for non-recurring decisions or "problem-solving." Any guide to management accounting must pay major attention to relevancy of information and its timeliness. Accuracy, while important, may be non-relevant. Future accounting information systems' needs are clearly outlined including structuring, cost-behavior rules, and responsibility accounting.

Choosing Accounting Practices for Reporting to Management*

Charles T. Horngren†

Objectives of Management Accounting

MANAGEMENT ACCOUNTING — ITS DISTINCTIVE PURPOSES

The accounting system is the major formal information system in almost every organization. An effective accounting system provides information for three broad purposes: (1) external reporting to stockholders, government,

* *From NAA Bulletin, Vol. XLIV, No. 1 (September, 1962), pp. 3-15. Reprinted by permission of the publisher.*

† I am indebted to the members of the Workshop in Accounting Research, Institute of Professional Accountancy, Graduate School of Business, University of Chicago — especially Professors Sidney Davidson, David Green, Jr., Richard Lindhe, and George H. Sorter — for constructive criticism.

and other outside parties, (2) internal reporting to managers for planning and controlling current operations, and (3) internal reporting to managers for making special decisions and formulating long-range plans.

Management (internal parties) and external parties share an interest in all three important purposes, but the emphasis of financial accounting and management accounting differs. Financial accounting has been mainly concerned with the first purpose and has traditionally been oriented toward the historical, stewardship aspects of external reporting. The distinguishing feature of management accounting is its emphasis on the second and third purposes.

The job of serving both internal and external demands can be an imposing one. Conventional accounting systems have tended to grow primarily in response to external forces. Management accounting, on the other hand, attempts to implement a more balanced, multi-goaled perspective. The widespread problem that management accountants must face has been aptly described as follows:

Very few people in business have had the opportunity to reflect on the way in which the accounting model developed, particularly on how an instrument well adapted to detect fraud and measure tax liability has gradually been used as a general information source. Having become accustomed to information presented in this form, business people have adapted their concepts and patterns of thought and communication to it rather than adapting the information to the job or person. When one suggests the reverse process, as now seems not only logical but well within economic limits, he must expect a real reluctance to abandon a pattern of behavior that has a long history of working apparently quite well.¹

A management accounting planning and control system should be designed to spur and help executives in searching for and selecting short-run and long-run goals, formulating plans for attaining those goals, implementing plans, appraising performance and pin-pointing deviations from plans, investigating reasons for deviations, reselecting goals, etc. Management accounting is concerned with accumulating, classifying, and interpreting costs and other information that induce and aid individual executives in fulfilling organizational objectives as revealed explicitly or implicitly by top management.

TYPES OF INFORMATION SUPPLIED BY MANAGEMENT ACCOUNTING

What information should the management accountant supply? The types of information needed have been neatly described by Simon *et al.* as a result

¹ William R. Fair, "The Next Step in Management Controls," in Donald G. Malcom and Alan J. Rowe, (ed.), *Management Control Systems* (New York: John Wiley & Sons, Inc., 1960), pp. 229-230.