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Accounting basis of inventories; Accounting research study no. 13

Horace G. Barden

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AN ACCOUNTING RESEARCH STUDY

THE ACCOUNTING BASIS OF INVENTORIES

By Horace G. Barden, B.S., CPA

STATEMENT OF POLICY

This accounting research study has not been approved, disapproved, or otherwise acted on by the Accounting Principles Board or by the membership or the governing body of the American Institute of Certified Public Accountants. The contents of the study, including the recommendations, are therefore not official pronouncements on accounting principles.

Accounting research studies are published by the Director of Accounting Research of the American Institute of Certified Public Accountants as part of the Institute's accounting research program. Studies were originally authorized to provide the Accounting Principles Board, members of the Institute, and others interested in efforts to establish accounting principles with background material and informed discussion that should help in reaching decisions on problems. This study is published with the intent that it may serve the same purpose for the Financial Accounting Standards Board.

Authors of accounting research studies are responsible for the content, conclusions, and recommendations. Studies do not necessarily reflect the views of the Accounting Principles Board, the project advisory committee, or the Director of Accounting Research.

Individuals and groups are invited to express their views with supporting reasons on the matters in this study. The last paragraph of the Director's Statement (p. xiv) gives details. Comments will be treated as public information unless a writer requests that his comments be confidential.

THE ACCOUNTING BASIS OF INVENTORIES

ACCOUNTING
RESEARCH
STUDY NO. 13

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Retired Partner
Ernst & Ernst

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Notice to Readers

The activities of the Accounting Principles Board and its research arm, the Accounting Research Division, which was created in 1959, will terminate June 1973. The series of accounting research studies, the first of which was published in 1961, will terminate in 1973 with the publication of the fifteenth study. Research studies authorized and assigned to authors prior to 1973 and not published in the accounting research series have been transferred to the AICPA's newly created Technical Research Division. This division was created by the AICPA to continue research on financial and reporting matters to support its positions before the new Financial Accounting Standards Board. All technical research activities of the Institute are consolidated in the new division.

D. R. Carmichael, Director
Technical Research

Contents

Director's Statement

Inventory is a major asset of most manufacturing and merchandising enterprises and is significant in many other types of companies. The cost or other basis of stating inventories is a key element in both balance sheets and income statements under present generally accepted accounting principles. But assigning a cost to inventories is rarely a simple, straightforward task, and many of the most difficult accounting problems relate to the subject that is traditionally called inventory valuation or inventory pricing. The notion of matching costs with revenue, which now occupies a central place in measuring net income for accounting periods, largely developed from inventory accounting.

Perhaps no area of accounting has been the subject of as much writing and discussion as inventories and cost of products sold. Yet inventory accounting continues to be criticized and is thought by many still to need major improvements. Almost no discussion of alternative methods in present accounting is complete unless Fifo and Lifo, and often other aspects of inventory accounting, are mentioned. An accounting research study on the subject is needed.

Mr. Barden attacked the monumental task at the time of his retirement from his firm. I express my appreciation to him for contributing to the accounting research program of the American Institute of Certified Public Accountants.

I also wish to express my appreciation to members of the project advisory committee for valuable assistance and for reviewing several drafts of the study. Two members of the committee could not review the final draft or participate in the final committee meeting. All others favor publication of the study. No member contributed comments to be published in the study. I seriously considered commenting on several aspects of the study but decided to forebear. Approval of publication or absence of published comments by a committee member or by the Director of Accounting Research should not be interpreted as concurrence with the contents, conclusions, or recommendations of the study.

Due to changes in Institute organization, described in Notice to Readers, this study will be one of the last accounting research studies. However, I invite interested individuals and groups to read the study carefully and submit comments on it to

D. R. Carmichael, Director
Technical Research
American Institute of CPAs
666 Fifth Avenue
New York, New York 10019

Comments submitted will be most useful if they cover not only the conclusions but also the analyses, premises, and arguments and if they include supporting reasons. The study and all comments received will be sent to the Financial Accounting Standards Board.

New York, N.Y., February 1973

REED K. STOREY
Director of Accounting Research

Author's Preface

When I was asked whether I would consider undertaking an accounting research study for the Accounting Principles Board after my retirement in the fall of 1968, the subject of inventory pricing was the only available one in which I had a genuine interest. My earliest practical experience consisted of four years in industrial accounting, and on many occasions during the thirty-eight years I spent in public accounting I was dismayed at what appeared to me to be a lack of understanding of cost accounting on the part of many practicing accountants and writers.

The Accounting Principles Board directed that the study be conducted within the framework of the present historical cost basis of accounting. My research, therefore, centered on present conventions, customs, and practices, and their influences on matters such as the composition of costs, the allocations of costs to units of product, and the use of unit costs in the accounting basis of inventories. That is the area described as cost accounting or management accounting, in which one finds the people who develop accounting data used by management in decision-making as well as much of the data used in public financial reporting. The cost concepts and principles which I sought to evaluate are based largely on the reasoning, the experience, the customs, and the usage of people in management accounting.

Partly because of my background, but primarily because I wanted to reach those with firsthand experience, those were the people whose counsel I sought through my interview program. Throughout this study, the emphasis is on the practical rather than the theoretical, on pragmatism rather than on a theorist's abstract approach of developing formal, logical frameworks within which to solve problems.

Many people contributed generously to the study, giving freely of time and technical knowledge. Seventy-eight corporate financial executives, thirty-six representatives of the companies' independent accountants, and eighteen top technical partners of eleven large accounting firms spent an aggregate of approximately four hundred hours discussing the subject of inventory accounting with me. Although their names are not listed, I express my gratitude to them for their willingness to help and their genuine interest in my research.

I appreciate the assistance received through discussions and correspondence with several authors of recent publications on relevant accounting topics and with representatives of the National Association of Accountants, the Financial Executives Institute, and the United States Treasury Department. I am particularly indebted to Robert K. Mautz, then of the University of Illinois, and to William J. Vatter of the University of California, Berkeley, who during the early stages of my study were working with the General Accounting Office on its study of the feasibility of uniform cost accounting standards for negotiated defense contracts.

Two doctoral candidates in business schools assisted in the research. John Boles of Michigan State compiled the original bibliography. C. Stevenson Rowley of the University of Wisconsin collaborated by undertaking his dissertation research on "Inventory Practices in the Grain Industry" and providing me the results of his basic research. Three accounting professors spent most of the summer of 1969 working with me on library research and assisted in developing the research format and the initial interview program. They were John Simmons of the University of Minnesota and Ernest I. Hanson and W. C. Stevenson of the University of Wisconsin. Professor Hanson also consulted with me in some of the later organization of the research data. Robert K. Mautz also gave generously of his time in assisting me in much of the editing of this study.

From the beginning of this study, its project advisory committee has consisted of Louis M. Kessler, partner, Alexander Grant & Company; David R. Arnold, Vice President and Comptroller, Continental Can Company, Inc.; Raymond A. Hoffman, retired partner, Price Waterhouse & Co.; Herbert E. Miller, formerly of Michigan State University and now partner, Arthur Andersen & Co.; Gertrude Mulcahy, Director of Research, The Canadian Institute of Chartered Accountants; Howard N. West, Treasurer, Broadway-Hale Stores, Inc.; and Earl J. Wipfler, retired Controller of the Monsanto Company. They have given generously of their time in discussions and in reviewing drafts of this study. I appreciate the counsel of Reed K. Storey, Director of Accounting Research of the American Institute of Certified Public Accountants, whose searching criticisms along the way caused me to sharpen and expand my research efforts.

Finally, I acknowledge the patience and understanding of my wife, Laura Barden, without which this project would have been considerably more burdensome.

Kenilworth, Ill., February 1973 HORACE G. BARDEN

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Research Problem and Program

The importance of inventories in accounting determinations of income and financial position for companies in manufacturing, wholesaling, retailing, and some other industries is generally recognized to the extent that it requires little additional emphasis. A variation in inventory pricing has a one-for-one impact on net income before taxes and on total current assets. Internally, inventory management is a major concern from the point of view of finance, marketing, and production. But more than that kind of importance was involved in the Accounting Principles Board (APB) planning committee's initiation of a formal research study on inventory pricing. It has been alleged that the variety of inventory pricing methods in use is such that companies in the same industry but using different inventory pricing methods can arrive at financial statements that cannot be compared meaningfully with one another.

Purpose of the Study

The purpose of this study of inventory pricing methods is thus to examine the alternative methods available for pricing inventories, to evaluate them in terms of the objectives of financial accounting, and to make recommendations that will assist the policy makers in their efforts to narrow the range of acceptable practice.

One important purpose of the study is to attempt to establish criteria which define the circumstances and conditions under which specific procedures are acceptable or preferable to all other applicable procedures. The conclusions of the study should answer to the greatest degree practicable the frequent objections to the so-called free choice among alternative inventory pricing methods.

In authorizing the research project, the APB stipulated that the

study should be made within the context of the historical cost basis of accounting. This has been interpreted to mean that the concept of income under which inventory pricing is to be utilized is based on the appropriate association of expenses and revenue rather than on the comparison of asset values at different dates as under so-called current value accounting.

The APB stated that a study of inventory pricing should include all aspects of determining accounting for the amounts assigned to inventories but not that of determining the physical quantities of the inventories.

For purposes of this accounting research study, inventory pricing is therefore considered in the broad perspective of representing the determination of carrying amounts assigned to physical quantities of merchandise, materials, and products on hand at the end of an accounting period that will be further processed, completed, delivered, billed, and collected for in future periods. Inventory pricing divides the historical costs of materials, products, and services acquired in producing or merchandising operations during an accounting period into (1) the portion that should be assigned as the costs of products and goods sold and expense of the period and (2) the portion that should be deferred as inventory cost to future periods in which the revenue from currently unsold goods and currently unbilled services will be realized.

The study should examine critically the arguments for differing views on fundamentals of the accounting basis of inventories with particular attention to the underlying logic in terms of basic accounting concepts as currently accepted by the APB. The study should also respect the expressed desire of the APB to identify possibilities of discouraging certain questionable practices and to extend the use of acceptable practices so as to obtain greater comparability of reporting among different entities.

To the extent that a variety of practices are found (a) to exist and (b) to be utilized to the detriment of the desirable qualities of comparability and understandability, the study should evaluate those practices in terms of stated criteria. Ultimately, perhaps, the purpose of the study can be described as one of providing information to rewrite Chapter 4 of *Accounting Research Bulletin No. 43 (ARB 43)*.

Nature of the Issues

Well known to most practicing accountants and also supported by the research data presented in this study is the fact that conditions

have permitted the establishment of various methods of inventory pricing as acceptable with little authoritative establishment of criteria to be used in selecting or preferring one pricing method over another. A common pattern of development has appeared with respect to inventory pricing, just as it has with respect to a number of other accounting treatments. Highly specialized methods have been developed for specific situations and then later have been seized on for applications not intended by their inventors. In some cases additional applications have little in common with the original set of conditions for which the practice was developed.

Accentuating the problem is the absence of clearly established and authoritative requirements that specific practices be used only under stated conditions. On the contrary, once an inventory accounting practice becomes generally accepted for any purpose, it seems to have obtained some degree of acceptance for every purpose.

ARB 43, Chapter 4, Statement 2, states the basic purpose of inventory pricing:

> A major objective of accounting for inventories is the proper determination of income through the process of matching appropriate costs against revenues. 3

The statement of purpose has been used by different accountants to justify different inventory pricing practices in substantially similar circumstances because no clearly established concept of income can be cited as a guide. Some argue in favor of a pricing method that calculates income by matching historical costs against revenue on the assumption that the oldest goods on hand are always the first items sold. Others have argued that the flow of inventory items through the company on a physical basis is not the controlling factor, but the relevance of costs to revenue in terms of price levels should be taken into account. For that reason, they compute income by matching against revenue the price of the most recent inventory items acquired. In a market experiencing steadily rising prices, the application of the two different inventory pricing methods may result in substantially different figures of net income. Yet *ARB 43* provides no clear guide for choosing between them.

In short, no well-established authoritative body of theory exists to which one can appeal in resolving issues of this type. *Accounting Principles Board Statement No. 4 (APB Statement 4)* cannot be accepted as such an authoritative body of principles because it clearly states that its purpose is to summarize what is rather than what ought

to be. In addition, *APB Statement 4* carries something of a disclaimer that

> *Publication of this Statement does not constitute approval by the Board of accounting principles that are not covered in its Opinions.*

Specific Issues. The subject of inventory pricing is one of such complexity that a brief and comprehensive identification of the issues involved is a difficult undertaking. Perhaps all that can be usefully accomplished at this point is an indication of the kinds of issues that must be dealt with before the study is completed.

Is there an inventory pricing problem? Are the various inventory pricing methods sufficiently different from one another that their implementation does result in significantly different profit figures? Do companies within the same industry actually use different methods?

Can criteria be established on an authoritative and logical basis that will identify the conditions or situations in which specific inventory pricing methods should be viewed as acceptable or unacceptable in the absence of an established body of theory? Is there a basis for regarding certain criteria as so important that their presence or absence should determine the acceptability of an inventory pricing method that may already be in substantial use in the absence of the conditions specified?

Whether criteria can or cannot be established, attention must be directed to specific pricing practices and their acceptability. For example, is the lower of cost or market pricing basis acceptable or unacceptable? Are the various cost flow assumptions to be continued as generally acceptable in all, or only in some, or in no cases?

Should inventory pricing in manufacturing companies be based at least partly on a notion of normal production and normal utilization of capacity?

Does the direct costing method of inventory pricing yield results that should be considered acceptable for external reporting purposes?

Nature of Research Problem

Given the points above, the difficulty facing the researcher appears obvious. Simultaneously he faces the alleged existence of a range of available alternatives and an absence of criteria that specify when a given alternative is or is not acceptable. Along with this he is charged to review the alternatives and determine which can or should be eliminated as not in harmony with the basic concepts of accounting. Thus he is not to accept the fact of widespread use as evidence in favor of continuing any specific method.

On the other hand, he finds only a limited, and sometimes contradictory, established theoretical structure to which he can refer in testing challenges to, or support for, alleged best methods. He thus finds himself with neither theory nor practice necessarily acceptable as a guide in resolving the issues listed and others like them.

However difficult this position might appear, it is not unusual in accounting. Accounting research seems continually to face situations in which practice is to be tested against a theory which does not exist, and theory is to be tested against practice which many find unacceptable. Under such conditions, the researcher's task must be viewed not as one of finding a fundamental truth supported by irrefutable data but rather as an assignment of seeking out the reasons advanced for what is done in practice or advocated in theory and then testing them against his own best view of what are, first, practical considerations and, second, valid theoretical considerations. The completion of such a project may find him with conclusions or recommendations still subject to criticism, but he should at least have contributed to an understanding of the problem through his analysis of reasons for and against various practices. Given the nature of this research problem, he cannot be expected to do more.

Such a research project calls for an empirical approach in which one tries to obtain from those in practice an understanding of what they do and, perhaps more important, an understanding of the reasons why they do it. At the same time, a conceptual study of the literature is required to discover what the reasons are that support various alternatives proposed as appropriate by theorists and others and to become familiar with their criticisms of other proposals. Finally, he must bring together the various arguments for and against practices, whether now accepted or merely recommended, and, by exercising his own evaluative judgment, reach those conclusions that he believes are most supportable.

It should be evident at the outset that in a subject such as inventory pricing, which has been argued endlessly over the years, research is unlikely to result in absolutely convincing evidence on any significant issue. On the contrary, the result from such a study is what I believe can be a set of carefully considered and deliberately selected recommendations that take into account all the information provided by the research program, but that will unavoidably be influenced to some extent by the researcher's experience and personal philosophy.

Research Program

The research program on which the recommendations of this study are based includes three main approaches: (1) a study of the literature, (2) a series of interviews, and (3) a conceptual analysis of the inventory pricing problem.

Literature Review. A review of the total literature concerned with inventory pricing is a monumental undertaking, far too much for any one person. Recognizing this, I assigned most of it to a team of university professors of accounting. A bibliography was compiled showing a breakdown of the literature by several broad areas of subject material. Problems relating to the determination of the accounting basis of inventories have been the subject of numerous publications by the American Accounting Association, the National Association of Accountants, and The Canadian Institute of Chartered Accountants, as well as the American Institute of Certified Public Accountants (AICPA). In addition, the subject is covered extensively in accounting texts and reference books and in articles by individuals published in the various accounting periodicals. The literature reflects the views of both theorists and practitioners and, to a lesser degree, the views of users of financial information.

As members of the review team completed their studies, each summarized his findings. Prior to the literature review, a series of charts was prepared showing certain broad assumptions as to cost identification by types of cost accumulation method, the degree of concentration of certain inventory accounting practices by industry, and similar general characteristics of the principal cost flow assumptions. The charts were further revised to reflect the findings of the review team. This provided me with a comprehensive understanding of what has been written on the subject of the research project as well as synopses and charts which facilitated my reference to that material throughout the study.

Interview Program. Using the findings from the survey of the literature, we developed an interview program intended to make the research team familiar with not only the practices currently in effect in industry but also the reasons why those practices are followed. The principal thrust of this phase of the study was directed to obtaining thoughtful, open-minded views of the broad issues involved in the subject and opinions regarding their possible solution. Since the mere fact of implementation was not to be regarded as conclusive support for any given method, only secondary emphasis was placed on statistics regarding practices, industry patterns, and the like.

We considered a questionnaire approach but, because of the nature of the subject, discarded it in favor of interviews which would permit the interviewer to follow up on responses that appeared to promise more information. To guide the interviewers, outlines were developed so that all interviews, whether conducted by different individuals or not, could be compared.

An early decision was that a large quantity of interviews was impractical because of the time involved in completing them and was also unnecessary. What was necessary was a sufficient number of intensive interviews of those people most familiar with the problems involved and most knowledgeable on the subject. Prospective interviewees were divided into three groups: (1) the top technical partners of large accounting firms, (2) accounting executives of industry, and (3) bankers and financial analysts who use financial accounting data.

Working in teams of two men, my three academic associates and I interviewed the top technical partners of twelve large public accounting firms. In each case, copious notes were taken during the interview and were later discussed by the team to make sure that no important matters in the interview had been omitted from the notes. Each interview consumed about two and one-half hours.

The same approach was used to interview corporate executives involved in positions of high responsibility within their companies. The companies initially considered for the program of interviews were selected as representative of various industrial classifications, with a particular effort to include companies known to have cost or inventory accounting practices peculiar to certain product lines or production processes. The final selections were made generally after consultation with the technical partners of large accounting firms so as to be reasonably sure of interviewing executives having an interest in the subject and familiarity with the accounting practices of others in their respective industries.

I conducted most of the interviews with officers of large publicly held companies. To balance the interview program, five interviews were held in a single Midwestern small town industrial area to obtain views of executives of relatively small, privately owned companies. All interviews were arranged through the public accounting firms, and a representative of the firm was present during nearly all the interviews. A total of 35 such interviews were held.

Although I had intended to interview users of financial statements, some early interviews with users were relatively unfruitful. The interests of bankers and analysts in the details of inventory pricing and their familiarity with the technical accounting aspects of inventory pricing are limited. Those interviews were discontinued.

On completion of each interview, the interviewer summarized his interpretation of the responses to about 50 questions contained in the interview outline. The information thus obtained constituted a major input of data for the conclusions I ultimately reached.

Conceptual Analysis. Because of the limited extent of authoritative principles or conceptual pronouncements, I considered it necessary to devise my own conceptual criteria. Taking into account my own experience, the views of my academic colleagues who worked with me on the study, and my understanding of the problem and the environment in which it occurs, I attempted to analyze the inventory pricing problem, commencing with its most simple aspects and progressing to more complicated considerations. My results are set forth in Chapter 2. It should be recognized by a reader that to a substantial degree the recommendations and conclusions of the study rely on this conceptual analysis. Any significant weakness in it has important implications for the conclusions.

Related Research Efforts. Two related research projects were under way at the inception of this study. One was the study by the United States General Accounting Office of the feasibility of applying uniform cost accounting standards to defense contracts. The second was a study of basic cost concepts and implementation criteria being conducted for the AICPA by a group of professors of Stanford University. Subsequently, the Committee on Management Accounting Practices of the National Association of Accountants established subcommittees to study the subject of inventory valuation and concepts for cost-type contracts. I have maintained contact with the concurrent

studies so as to coordinate their efforts with this study wherever possible. It seems fair to state at this point that none of those studies found it necessary or desirable to investigate inventory pricing methods to the same extent or in the same way as I found necessary. Thus, although I have kept in touch with them, they have had relatively little influence and have made little contribution to my recommendations.

Terminology

I have tried to conform generally with the language and meanings used in *APB Statement 4,* excerpts from which are in Appendix B. Possible differences in interpretation of certain terms as between that language and terminology commonly used in cost accounting and in this report are explained in hopes of obtaining more effective communication of the subject.

The Accounting Basis of Inventories. The APB originally designated the project as a research study of "inventory pricing." In a recent survey, *Accounting and Auditing Approaches to Inventories in Three Nations,* the Accountants International Study Group said that despite its dislike for the term *valuation,* it would use the term as a convenient abbreviation for the "amount at which stock is carried." I believe common usage of terms such as *valuation, cost,* and *pricing* become easily confused with their technical accounting meanings even if the latter are specifically described. Accordingly, I use the term *the accounting basis of inventories* in most places in preference to describing the determination process as one of either pricing or valuation.

Production. *APB Statement 4* outlines broad operating principles in terms of three types of events that affect the financial position of business enterprises: (1) transfers of resources or obligations to or from other enterprises, (2) production, and (3) events largely beyond the control of the enterprise. Production is then defined as the economic process by which goods and services are combined to produce an output of product in the form of either goods or services. The term thus encompasses all internal profit-directed activities, such as merchandising, and is not restricted to manufacturing.

In management accounting terminology, the term *production* frequently refers only to bringing manufactured products to the state

in which the enterprise normally delivers them to its customers. Accordingly, all costs directly and indirectly associated with this perspective of the production processes are described as production costs and are generally reported in income statements under the caption of cost of products sold. The costs and expenses relating to an enterprise's functions of research and development, general distribution, marketing and product management, general administration, and financing are usually referred to in management accounting terminology as period expenses (or sometimes commercial expenses) and are reported in income statements under their respective broad functional classifications.

Functional descriptions of broad accounting classifications are used throughout this study wherever practical so as to avoid possible conflict between conventional management accounting terminology and the broader concept of the term production in *APB Statement 4.*

Defining Terms. I attempt to use operational descriptions of major technical terms throughout the study. I believe the combination of descriptions with illustrations provides a more effective communication of the meaning of terms than is possible through attempting precise definitions.

Summary of Findings and Conclusions

As the research proceeded, concepts were clarified and conclusions were formulated, tested, modified, retested, and finally established as valid in view of the research findings. The conclusions cannot stand alone; they require patient study of the research evidence included in the subsequent chapters of this study both for understanding and for support. They are summarized at this point to aid those who find a synopsis of conclusions useful as an introduction and as an indication of important matters warranting special attention throughout the study.

Diversities in Practice. Early inquiries showed ample evidence that practices that can give rise to differing accounting bases for similar inventories are in common use. Published reports include differing descriptions of cost and of cost flow assumptions even for companies in the same industry and with similar types of products. The bibliography compiled on the subject contained many articles advocating controversial positions on inventory cost flow assumption and the

identification and allocation of cost elements to units of production. Discussion with top technical partners of large accounting firms confirmed the existence of diverse practices.

Diversities in inventory practice may be classified in three general groups:

1. Differences in the composition of product costs and in the allocation of costs to units of production. The questions revolve around determination of the costs to be associated with production operations and used in calculating unit product costs.
2. Differences in cost flow assumptions used in compiling the cost of year-end inventories and cost of products sold. Problems generate from the potential lack of valid comparability between Lifo applications and between Lifo and Fifo applications in substantively similar circumstances.
3. Differences in implementation of the concept of lower of cost or market. Differing interpretations of the meaning of the term *market* and complexities in applying the present rule can result in significant differences in reported results.

Application of Cost Basis. No significant diversities of practice were found in applying cost to inventory in the merchandising field. If production processes are involved, the determination of unit product costs is an integral part of the management planning and decision-making processes, and those costs tend to vary with the nature and activities of a company. Management needs to know its product costs for purposes of planning sales and pricing policies, for long-range consideration of product mix and production facilities, for controlling production costs, and for income determination. These various uses of cost accounting data are all interrelated in management responsibility, action, and evaluation.

Both theorists and practitioners have long recognized the complexities of cost accounting problems such as production cost abnormalities and costs of excess capacities, as they influence both managerial decisions and income determination.

I conclude that many of the diversities in cost determination can be narrowed or eliminated by expanding authoritative pronounce-

ments to include basic concepts and broad principles developed through the analytical cost accounting processes that underlie management's decision making. I recommend that the policy makers favor absorption costing for general financial reporting. Other recommendations relating to cost include statements of principle on the composition of product costs, accounting for direct costs, normalization of cost factors, and allocation of indirect production costs to units of product.

Cost Flow Assumptions. One of the important characteristics of a unit of product, whether produced or purchased, is its cost. Intuitively, people expect to identify a unit of product and its cost. If a unit appears in sales, they expect the cost to follow in cost of sales. Situations are limited, however, in which it is practicable to identify specific unit costs with units of product throughout a manufacturing or merchandising process.

Fifo. If specific identification is impracticable, an assumed cost flow provides a means of matching unit costs with the sales prices of units sold and with the remaining units on hand in inventory. An assumption of a first-in first-out flow of costs generally coincides with the actual physical flow of products and merchandise since management usually attempts to dispose of units in that order. Accordingly, the Fifo assumption of cost flow typically achieves the closest practicable approximation to specific cost identification for pricing inventories and for matching costs with revenue. I conclude, therefore, that specific identification of costs and, if that is not practicable, the Fifo cost flow assumption represent approaches to inventory cost determination which are sound in principle.

Base stock. A minimum quantity of inventory can be identified as necessary in certain types of operations to maintain a continuing production operation. The fixed amount of inventory can be made available for sale only by terminating, or at least interrupting, the production process; remove it and the process must be shut down. The cost of minimum inventories is analogous to plant investment. The base stock method of inventory accounting assigns an arbitrary or nominal cost basis to such a fixed minimum quantity and carries the balance of the inventory on a Fifo basis.

Lifo. The base stock method was disallowed for income tax purposes in the 1920s. Lifo was adopted as a substitute for the base stock method and became acceptable for income tax purposes in the late 1930s. Lifo was originally limited to certain petroleum and mineral inventories, but later its use for tax purposes was extended to all

companies. Lifo prices year-end inventories at current year costs only to the extent that quantities on hand at year end exceed those on hand at the beginning of the year. The effect on the income statement is to match current year sales revenue with the latest cost for the number of items sold.

The result is that inventories in the balance sheet are priced at varying cost levels dating back usually to the year in which the method was originally adopted. The method dissociates the flow of costs from the flow of product or merchandise, thereby making comparisons confusing between companies introducing Lifo at different times and even more so between a company using Lifo and one using Fifo, though the inventories may be identical physically.

Companies using Lifo for income tax purposes are required by law to use the method for general financial reporting.

I find no logical justification for matching the cost of one unit with the sale price of an entirely different unit. The application of Lifo defies the kind of ordinary logic that has the intuitive appeal I find in Fifo. On the other hand, some good reasoning favors the base stock method if a base stock element is clearly visible and essential in a manufacturing or merchandising operation. Lifo is a satisfactory substitute for the base stock concept in those situations, especially since it is the only one permissible for tax purposes.

Disclosure of effect of Lifo. I find it impracticable to attempt to establish criteria that identify circumstances requiring the use of Lifo to the exclusion of all other methods. I cannot justify the extent to which Lifo restricts meaningful comparisons between companies having substantively similar inventories. Accordingly, I conclude that enterprises using any cost flow assumption other than specific identification or Fifo should be required to disclose (1) the effect on net income for the period and on the balance sheet inventory amounts of the method used as compared with Fifo and (2) related tax effects.

Lower of Cost or Market. I concur in principle with the concept which requires a departure from the cost basis for inventories if the utility value of inventory items is no longer as great as their cost. I also agree that the amount of the departure should be recognized as a loss in the period in which it is determined. I do not concur, however, that the market value with which to measure such losses should be the replacement or reproduction cost.

The element of profit is an inseparable ingredient of the inventory concept, and the profit-making potential of inventory items is a reasonable man's measure of their utility value at a particular time. Manage-

ment inherently involves a continuing process of planning and striving, formally or informally, to attain profit potentials. This requires projecting cost/price relationships to determine the extent to which sales prices will provide margins over unit costs sufficient to cover the direct selling expenses and allocable portions of general selling and administrative expenses and to yield a profit. Losses in utility value may be indicated as a result of both internal and external changes in either input costs or selling prices.

Although changes in costs or selling prices may *indicate* potential losses, the *earliest point at which losses can be measured with a reasonable degree of accuracy* is the time when the enterprise's management adopts a planned course of action relative to the use or disposal of the affected items. Only then can resultant net realizable amounts be determined.

I conclude that net realizable value should be the basis for measuring and recognizing potential losses in utility value of inventory items. Net realizable value should be calculated on the basis of anticipated selling prices less (1) costs of completion and (2) appropriate portions of marketing, administrative, and general costs that the enterprise ordinarily treats as expenses of the periods in which they are incurred. The implementation of this principle of "lower of cost or net realizable value" should not serve to increase the margin between the expected selling price and the reduced cost basis of the affected items beyond that which existed immediately prior to the discovery of the factors that gave rise to the reevaluation of the inventory amounts.

General Format of Presentation

My final summarization of findings and conclusions is presented in Chapter 9 in the form of a recommended restatement of the present authoritative pronouncement on the accounting basis of inventories as set forth in Chapter 4 of *ARB 43*. Chapter 2 presents the conceptual analysis that is vital to the ultimate conclusions. There, I attempt to develop certain conceptual criteria which then serve as a basis for evaluating various inventory practices either in use or proposed for adoption. That material in Chapter 2 and the statements of problems and reasoning entering into the conclusions, which are presented in the intervening Chapters 3 through 8, must be examined to judge the conclusions.

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A Conceptual Analysis of Inventory Pricing

Theory and Practice

The purpose of this chapter is to begin developing a conceptual analysis of the inventory pricing problem which will then provide guidance throughout the rest of this study in resolving issues like those listed in Chapter 1. The problem facing the researcher and the limited extent of general authoritative criteria were described in Chapter 1. The conceptual analysis in this chapter attempts to fill part of the void resulting from the deficiencies in present authoritative statements of principles or concepts.

ARB 43 and *APB Statement 4* both include some criteria that relate directly to the inventory pricing problem. Part of the purpose of this study, however, is to examine and challenge those criteria.

Diversity of Audience. The difficulty of working with a limited theory base is compounded by the diversity of the audience to which this study must be addressed. Those interested in the subject can be divided into two general classifications: (1) practitioners and processors of accounting information and (2) accounting theorists. The first group includes members of the accounting departments of corporate business enterprises, management users of the information prepared by accounting departments, and accountants who express professional opinions on the financial statements produced. Those people tend to see accounting problems in their natural state as real-life situations. All of them recognize the need for principles to serve as guides so that external users of accounting information find that comparable accounting treatment has been accorded to circumstances of comparable substance. However, members of the group place primary emphasis on

the usefulness of the accounting information produced and give only secondary consideration to the theoretical precision of the underlying concepts and principles.

In contrast, accounting theorists tend to place the greatest emphasis on the formal derivation of the accounting principles applied. Frequently, the principles are developed through deductive reasoning with no empirical testing and with no application to real-life situations. Many theorists see themselves in the role of critic of the accounting profession and, having no basis for criticism other than deductively derived theories, they tend to view an apparent violation of formal logic as a major fault.

Resolving accounting issues convincingly for both types of parties requires a continual interchange between abstract theorizing and practical problem solving. In a sense, that is one of the major problems of this study. The study represents an effort to test the accepted practices of the real world against the logic of theory and to test the theories against the realities of practice.

The continuing conflict of the theorist and the pragmatist poses a problem. The theorist seeks a logical framework within which to attack problems in such a way that the variation in solutions to those problems is minimal. Often he does that with little appreciation of the full range of differing situations and problems.

The pragmatist, on the other hand, finds great satisfaction in solving problems on the basis of his experience. He has less concern with the niceties of theory but is much aware of the effect of varying conditions. That is not to say that the pragmatist completely turns his back on theory or that the theorist is never conscious of the difficulties faced by the practitioner. Rarely, however, is either of them fully sympathetic to the problems of the other.

The current popularity of empirical research is such that some explanation may be necessary as to why this study gives no greater attention to empirical research methods than it does. I concluded that the issues at hand do not lend themselves to solutions through large collections of empirical data because current practice is what is being challenged. To seek to discover what current practice is or why it is followed would be in no way convincing to those who have challenged it. On the other hand, those who are faced with the problems of practice are unlikely to be any more convinced by a consensus among theorists than theorists are convinced by a consensus among practitioners. Hopefully, a conceptual analysis will add a new element in the form of some basic criteria that will permit resolution of some of the issues.

Present Generally Accepted Practice For Inventory Pricing

Cost Basis. Chapter 4 of *ARB 43* prescribes cost as the basis for inventory pricing and elaborates on this briefly by indicating that nonmanufacturing costs are to be excluded. A corollary of the cost basis, of course, is the realization principle that forbids recognition of revenue until "(1) the earning process is complete or virtually complete, and (2) an exchange has taken place" (*APB Statement 4*, paragraph 150) so that the inventory item has been purchased by an independent party whose purchase corroborates an increase in value. The APB has directed this study to accept the cost basis and the realization convention as established principles.

Cost Flows. *ARB 43* further recognizes the necessity of cost flow assumptions to implement the matching principle under conditions of changing prices. The criteria recommended in *ARB 43*, Chapter 4, for selecting an appropriate flow assumption are ambiguous and circular: "Cost for inventory purposes may be determined under any one of several assumptions as to the flow of cost factors (such as first-in first-out, average, and last-in first-out); the major objective in selecting a method should be to choose the one which, under the circumstances, most clearly reflects periodic income." Because a generally accepted definition of income is lacking, the standard provides little guidance. The major purpose of inventory pricing is to facilitate income determination, and income determination is suggested as the guide to selecting appropriate pricing methods.

The discussion that follows the basic statement in Chapter 4 of *ARB 43* points out that the identified costs of the items sold need not necessarily be matched against revenue for income determination purposes. Nor is an enterprise required to use the same method from one kind of inventory item to another. One can scarcely imagine the door more open for selection of inventory flow assumptions. Criteria for the selection of an appropriate inventory flow assumption therefore become one of the major purposes of the following conceptual analysis.

Lower of Cost or Market. Generally accepted inventory practice requires the application of the lower of cost or market rule. *ARB 43* states that a departure from the cost basis is required if utility of goods is no longer as great as its cost and that, if there is evidence that their disposal in the ordinary course of business will yield less than cost, the difference should be recognized as a loss of the current period.

That is generally accomplished by stating the goods at a lower level commonly designated as "market." The discussion concludes that the measurement of losses is accomplished by applying the rule of pricing inventories at cost or market, whichever is lower, and that the basis provides a practical means of measuring the utility of goods and recording losses in utility in the current period. *ARB 43* describes current replacement cost as representing market, except that (1) market should not exceed net realizable value and (2) it should not be less than net realizable value reduced by an allowance for an approximately normal profit margin. The discussion in Chapter 4 of *ARB 43* points out that, as a general guide, utility is indicated by the current replacement cost of the goods as they would be obtained by purchase or reproduction, but judgment must always be exercised in applying the rule to assure that no loss is recognized unless the evidence clearly indicates that a loss has been sustained. The guide offered as to whether the rule should be applied by items, by categories, or in total also stresses the need for exercising the judgment necessary to achieve a result that most clearly reflects income and does not provide for losses if none are clearly evident.

18 **Purchase Commitments.** In addition, *ARB 43* requires the recognition of accrued net losses on firm purchase commitments. That is consistent with recognizing decreases in the cost or replacement price of assets but, as some theorists point out, is inconsistent with refusing to recognize increases in the replacement price of assets.

APB Statement 4 does not concern itself with inventory pricing in so specific terms. However, it draws generalizations from the specifics of such authoritative documents as *ARB 43* so that they do not conflict.

Summary of Present Practices. In summary, inventories are to be priced at cost, excluding nonmanufacturing costs. Cost may be determined on any of several cost flow assumptions that in the judgment of the one doing the accounting is most appropriate in the circumstances. And if he has a number of inventory items, he is at liberty to use more than one cost flow assumption at the same time. To the extent that replacement cost is less than cost, replacement market prices must be used instead of cost, and the notion is extended to the replacement market price for inventory firmly committed to be purchased in the future.

Much of *ARB 43* represents a reaction to problems of inventory

pricing in specific situations for which accountants and others have suggested special treatment. Inventory pricing problems are complex in a company with a variety of sophisticated products, some of them manufactured within the company and some purchased from outside, that have to be processed, warehoused, and finally sold. A variety of inventory pricing possibilities has been developed to meet the variety of situations in which a variety of companies must price inventories. Perhaps by turning away from those complexities and examining inventory pricing problems under the most simple terms we can get at the essence of the problem and from that draw some useful conclusions. What is the nature of the inventory pricing problem if it is unencumbered by the complexities of practice?

The Simplest Case

Relation of Cost to Sales Price. Perhaps the simplest situation is a venture in which a single piece of merchandise is acquired and then sold. To simplify the matter further, let us assume accounting on a project basis rather than on a time basis. Under such conditions there is literally no alternative available. The cost of the item purchased must be matched against the sale price of that item, so apparently there is no inventory problem. Yet a lesson is to be learned. Although we have no inventory pricing problem there is still an element of cost flow; the cost of the precise item sold is matched with its sales price. In the simplest of situations, the cost of goods sold is the identified cost of the item sold.

If the venture consists of one purchase and a number of sales or a number of purchases and a single sale, the situation remains essentially the same. As long as we account for it on a project basis, cost of goods sold is the identified cost of the item or items sold.

Now let us consider the activities of a merchandising company. Let us assume first that it handles but one product, that although prices are stable the product comes in various models so that it is nonfungible, and that the various items carry different prices. A common illustration is an automobile dealership. To determine how well the company has carried on its affairs for a given period of time, one would want to match the identified costs with the selling prices of items sold. In effect, each car represents a different venture as the company buys and sells it. To judge the success of each venture, the company must bring together the cost of the car and its selling price. In that way, it learns whether certain items are more or less profitable

than other items—or whether they are profitable at all. Intuitively, one wants to determine profit on an item-by-item basis. If one is the manager, that procedure tells him how he can best conduct his business in the future. If one is not a manager, it reveals how well the management is selecting its product and disposing of it.

Thus far the emphasis has been on the cost of goods sold side of inventory pricing. But unless the cars on hand are priced at cost and the costs are carried over to subsequent periods, the possibility of matching costs with selling price in the period of sale on a car by car basis is frustrated. That will deny to management the information it needs to determine whether it should be changing prices, products, or salesmen and in the same way denies to external users of the financial statements an indication of whether management is conducting its business as well as it might.

If one were to draw a conclusion based on the illustrations, he would conclude that inventory pricing should match the cost of an item sold with the sales price received when the item is sold.

Assumption of Cost Flow. Let us next consider a different kind of product, one that is fungible so that one unit of product is just like another. If the product deteriorates over time, the physical flow of products through the company—that is, from purchase to sale—is likely to be on a first-in first-out basis. Short of exceptional circumstances, no management retains a product that deteriorates over time any longer than necessary.

Most products do deteriorate over time, so we might first generally conclude that the physical flow of products through a company tends to be on a first-in first-out basis. At the same time we must recognize that the physical flow might be otherwise because of materials-handling practices, because the product deteriorates slowly if at all, or because some other reason keeps the physical flow from being on a first-in first-out basis for periods of time in excess of an accounting year.

Now let us assume that items of the product have been purchased at different prices. Which acquisition prices should be matched with which disposition prices? Intuitively, people expect price to follow the merchandise to which it relates. One of the characteristics of a unit of product is its cost. Accountants sometimes use concepts under which the cost of a product is something separate from the product, but it seems unlikely that others do so. The same kind of reasoning that one tends to apply to a venture carries over into a continuing

operation, which in many ways is nothing but many ventures combined. An assumed cost flow different from the physical flow of merchandise requires justification if it is to be accepted as reasonable. When one argues that he can properly determine the profit on the sale of the unit only by matching the cost of an entirely different unit with the price of the unit sold, he defies the kind of ordinary logic that intuitively appeals to most people.

If the response to this contention is that the effect of inflation must be considered in some way, the reply might well be that indeed it should. But compensating for the results of inflation is a different problem. Conceptually, there is no overwhelming reason why it should influence inventory pricing. The intuitive appeal of matching the identified cost of an item with its identified sales price is too great to be ignored by accountants if they want financial reports to be generally understood.

The conclusion is not provable on grounds of formal logic. Possibly an empirical test of the understandability of various cost flow assumptions could be devised and applied, but that is left to others. For the purposes of this study, and solely on the grounds of intuitive appeal, a reasonable conclusion is that the cost of goods sold of an item or group of items should include the identified cost of those specific items or the closest approximation thereto. Further, the expectation is that costs will be determined on a first-in first-out basis unless special circumstances indicate a different physical flow.

The implications for inventory pricing are evident—determinations of cost of goods sold depend directly on present inventory pricing practices. The cost of the goods on hand at year end certainly has no relation to revenue from items sold during the year and should be carried forward to be matched against the revenue recognized when the goods are sold.

Cost Relevance. The principle involved is an application of a fundamental accounting idea. We should match with revenue those costs which help to bring about the revenue. The inventory is a cost to be matched against future, not past, revenue and therefore we again intuitively conclude that inventory cost should not include (1) costs that are related to past revenue, (2) costs that are not revenue-directed, and (3) costs that are not expected to produce revenue in the future. The principle is not difficult to understand, but in spite of its clarity, the problems of application are surprisingly difficult.

Some costs are difficult to relate clearly to either past or future

sales. The merchandising company in the illustration earlier in this chapter incurs a continuing flow of costs for providing operating facilities and in carrying out the functions necessary for purchasing, handling, storing, advertising, and selling its merchandise and for generally administering overall operations. Should a portion of costs for the year be considered as part of the costs of the goods on hand at the year end and therefore be carried forward to be matched against future revenue? Certain of the delivery, promotion, and selling costs of the year can be identified readily with sales made during the year. But many of the general purchasing, advertising, selling, and administrative costs do not relate to specific sales in the same way as do the purchase prices of the items sold.

And we can argue interminably about whether the cost of the long-range planning activities of certain administrative officers should be deferred and matched against future sales which are expected to benefit by the planning.

Also, although we can agree that inventory should not include costs that are not revenue-directed, we might have difficulty in agreeing as to what revenue-directed means. Charitable contributions of a business corporation may seem to have no revenue implications. Yet failure to contribute may adversely affect a company's image in the community and even its success in recruiting necessary personnel, and it may have a detrimental impact on net income through either increased expenses or decreased sales.

Finally, expectations regarding the relationship of present inventory costs to future revenue are judgmental and can be verified only after passage of time. The combination of factors raises continuing questions about what should be included in inventory cost. Those questions are resolved in both accounting practice and accounting theory by what is little more than a rule of thumb: that no costs of selling or general administration should be included in inventory.

A corollary financial accounting rule—that no losses of any kind should be deferred to subsequent periods—has special application to inventory pricing. The rule applied to inventory pricing has less intuitive appeal than previous conclusions in this chapter. The concept on which the rule is based is clear in principle but calls for continual judgment in practice. A loss of utility in inventory items should be recognized when it occurs, but questions arise as to when a potential inventory loss becomes evident and how the amount of loss should be determined. If external market influences clearly indicate that

the costs incurred on one or more products will not be recovered, it seems reasonable that the loss should be recognized in the next report on profit-directed activities.

How much of the cost has lost its profit potential depends on how management decides to dispose of the inventory on hand. Once this is decided, managers are able to project necessary additional costs to be incurred and the amount of revenue expected to be realized. The extent to which inventory cost exceeds the anticipated amount of net revenue to be realized seems intuitively to be a reasonable measure of the inventory loss incurred. While we can agree on the desirability of a rule (such as the lower of cost or market) against carrying forward losses, its major strength seems to be the absence of a more compelling substitute rule.

The Complex Case—Manufacturing

To move to more complex inventory pricing problems, we can consider the inventory of a manufacturing concern. Instead of buying the products to sell to customers, the concern makes them. To the flow assumption question already considered, manufacturing adds the problem of relevant and irrelevant costs to a much greater degree than is found in a retailing establishment.

Manufacturing Costs. Let us assume, for example, that we have been distributors of lawn and garden equipment and we now decide to manufacture a lawn mower of our own design. Our present merchandising organization must now be expanded to provide the plant, equipment, and functional organization necessary to carry on manufacturing operations. The costs of owning and operating the manufacturing capacity plus the costs of the materials, labor, and services consumed, directly or indirectly, in the various operations involved in making the mowers now become the costs of the units we sell. The new costs, which production of a mower requires, represent that mower's unit cost, comparable to the purchase price we have been paying former suppliers.

Let us assume for simplicity that we acquire a complete plant and an organization capable of manufacturing mowers and immediately start producing mowers of our own design in quantities sufficient to meet our present customer needs. One might assume that determining the unit costs of mowers completed presents little problem. We merely need to divide the total costs incurred in the operation by the number

of completed units shipped. But we have some inventory problems even in this simple cost determination situation. Some of the costs incurred do not expire completely each month or within whatever accounting period we select to calculate the costs of mowers transferred. Some materials are always on hand, as well as some finished component parts and some partly assembled mowers. The inventories make it essential that we establish inventory accounting procedures to relieve each period's production costs of that portion of such costs which relate to mowers that will be completed in future periods.

Abnormal Costs. We find also that unit costs of the mowers are considerably higher in our first season of operations because we are not using the plant at the level of utilization we expect to attain eventually. Certain plant operating costs (such as depreciation, property taxes, insurance, and plant administration salaries) are incurred each month in relatively constant amounts regardless of how many mowers we produce. Dividing the relatively fixed element of our plant costs among present units completed creates a much higher unit cost than we expect to experience as we increase mower production in the coming year and begin to manufacture other equipment items. We find also that, because some of the plant's equipment is not suitable to machining the type of castings specified from the foundry supplier, we have experienced extraordinarily high costs for rework and scrap losses. Averaging the two types of extraordinary costs into the costs of the units transferred to the merchandising division creates an internal organizational snag when the merchandising management becomes aware of the resultant decline in recorded profit margins.

We now see the concept of utility value of inventory from a different perspective. Utility value is essentially the profit-producing potential of a product. If the products manufactured in our new venture have less profit potential than we expected, where did we lose it? The loss certainly was not in our merchandising operations. The answer is that some of our costs have been costs of not producing rather than costs rationally allocable to the units produced. The costs might better have been set apart from the flow of normal production costs allocated to finished products. They have more of the characteristics of losses than of production costs, and we return to our earlier concept that no useful purpose is served by carrying the losses forward as part of the cost of the units on hand in inventory. We seem to have discovered an additional concept—namely, that the cost of items manufactured is more meaningful if it excludes abnormalities.

Additional Complexities. Our lawn mower venture illustrates a few of the concepts underlying cost determinations and the problems of implementing them even in the classic simplicity of the one-product, one-plant situation. What new concepts and problems arise in the more common multiproduct manufacturing operations? For example, let us assume that we begin producing a lawn sweeper and a snow blower to utilize more of the available capacity of the plant. Our inventory accounting requirements expand to show how much of the total costs incurred in an accounting period should be carried forward as allocable to materials, partly finished units, and finished units of the three different products for which we incur direct costs as well as many costs common to all three. Further, the extent to which some facilities are used in fabricating the different products varies. The three products have different unit costs which must be determined for inventory purposes. Our cost identification processes must be refined to determine which of the costs are caused by the production of which products.

The cause and effect relationship is basic to most of the broad concepts of product cost determination in the more complex manufacturing operations. We can identify certain costs, such as materials and labor expended in the fabrication of products, because we can see and measure the amounts of the costs caused by the production processes. We can identify certain indirect costs of maintaining the overall manufacturing organization with the more directly identifiable operations caused by the production of various products. The entire concept of cost identification begins to expand at this point to something far beyond the mere search for a unit cost with which to price an inventory item or to match against the revenue produced by the sale of one unit. It becomes more of an analytical process, carried out systematically over time to provide information for management's planning and controlling of the profit-directed activities of the enterprise.

Preview

The foregoing conceptual framework is expanded in the following two chapters to identify inventories more clearly as the keystone component of the cost of products sold in general financial reporting and to examine the extent to which the management accounting environment influences the accounting basis of inventories.

3

Cost of Goods or Products Sold

The Concept

An understanding of the meaning of the term *cost of goods sold* or *cost of products sold* as it is used in general financial reporting is necessary to an analysis of cost concepts and principles and the accounting environment in which they are applied. Notwithstanding the common usage of the terms, they are frequently used in technical writing with connotations of precision that are unrealistic at best and may foster widespread lack of understanding of the basic concepts which underlie their meaning in financial accounting.

Part of the conceptual analysis presented as a theoretical base for this study (pages 19 to 21) uses a merchandise operation to illustrate the simplest problems of inventory determination and a manufacturing operation to illustrate the more complex. The same comparison is used to illustrate the cost of products sold concept in teaching accounting at elementary levels, as shown in Exhibits 3-1 and 3-2, which are taken from Horngren's text.[1] The exhibits are pre-

[1] Charles T. Horngren, *Cost Accounting: A Managerial Emphasis,* Third Edition (Englewood Cliffs, N.J.; Prentice-Hall, Inc., 1972), pp. 29-33.

EXHIBIT 3-1

Comparison of Income Statements

NENTLAW (*A manufacturer*) *Income Statement* *For the Year Ended December 31, 19_2*			CRUMP'S (*A retailer*) *Income Statement* *For the Year Ended December 31, 19_2*		
Sales		$210,000	Sales		$1,500,000
Less cost of goods sold:			Less cost of goods sold:		
Finished goods, December 31, 19_1	$ 22,000		Merchandise inventory, December 31, 19_1	$ 95,000	
Cost of goods manufactured (see schedule)	104,000		Purchases	1,100,000	
Cost of goods available for sale	$126,000		Cost of goods available for sale	$1,195,000	
Finished goods, December 31, 19_2	18,000		Merchandise inventory, December 31, 19_2	130,000	
Cost of goods sold		108,000	Cost of goods sold		1,065,000
Gross margin		$102,000	Gross margin		$ 435,000
Less selling and administrative expenses (detailed)		80,000	Less selling and administrative expenses (detailed)		315,000
Net income		$ 22,000	Net income		$ 120,000

NENTLAW

*Schedule of Cost of Goods Manufactured**

Direct materials:		
Inventory, December 31, 19_1	$11,000	
Purchases of direct materials	73,000	
Cost of direct materials available for use	$84,000	
Inventory, December 31, 19_2	8,000	
Direct materials used		$ 76,000
Direct labor		18,000
Factory overhead:		
Indirect labor	$ 4,000	
Supplies	1,000	
Heat, light and power	1,500	
Depreciation—Plant building	1,500	
Depreciation—Equipment	2,500	
Miscellaneous	500	11,000
Manufacturing costs incurred during 19_2		$105,000
Add work-in-process inventory, December 31, 19_1		6,000
Manufacturing costs to account for		$111,000
Less work-in-process inventory, December 31, 19_2		7,000
Cost of goods manufactured* (to Income Statement)		$104,000

*Note that the term *cost of goods manufactured* refers to the cost of goods brought to completion (finished) during the year, whether they were started *before* or during the current year. Some of the manufacturing costs incurred are held back as costs of the ending work in process; similarly, the costs of the beginning work in process become a part of the cost of goods manufactured for 19_2. Note too that this schedule can become a Schedule of Cost of Goods Manufactured and Sold simply by including the opening and closing finished-goods inventory figures in the supporting schedule rather than directly in the body of the income statement.

Source: Charles T. Horngren, *Cost Accounting: A Managerial Emphasis,* Third Edition © 1972. Reprinted by permission of Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

sented to show that inventories are an essential element in determining the amounts described as cost of goods or products sold in general financial reporting. The exhibits also provide a good graphic illustration of differences between components of the cost flow in merchandising and manufacturing enterprises.

The schedules at the top of Exhibit 3-1 show that determining cost of goods sold in merchandising and manufacturing operations is basically similar. The beginning inventory of goods for sale plus additions to inventory during the period less ending inventory equals the figure described as cost of goods sold in both operations. Merchandise inventory and finished goods inventory are conceptually alike; the difference in terms is merely descriptive—one kind of inventory is purchased in finished condition from outside sources for resale, the other is manufactured by the selling concern.

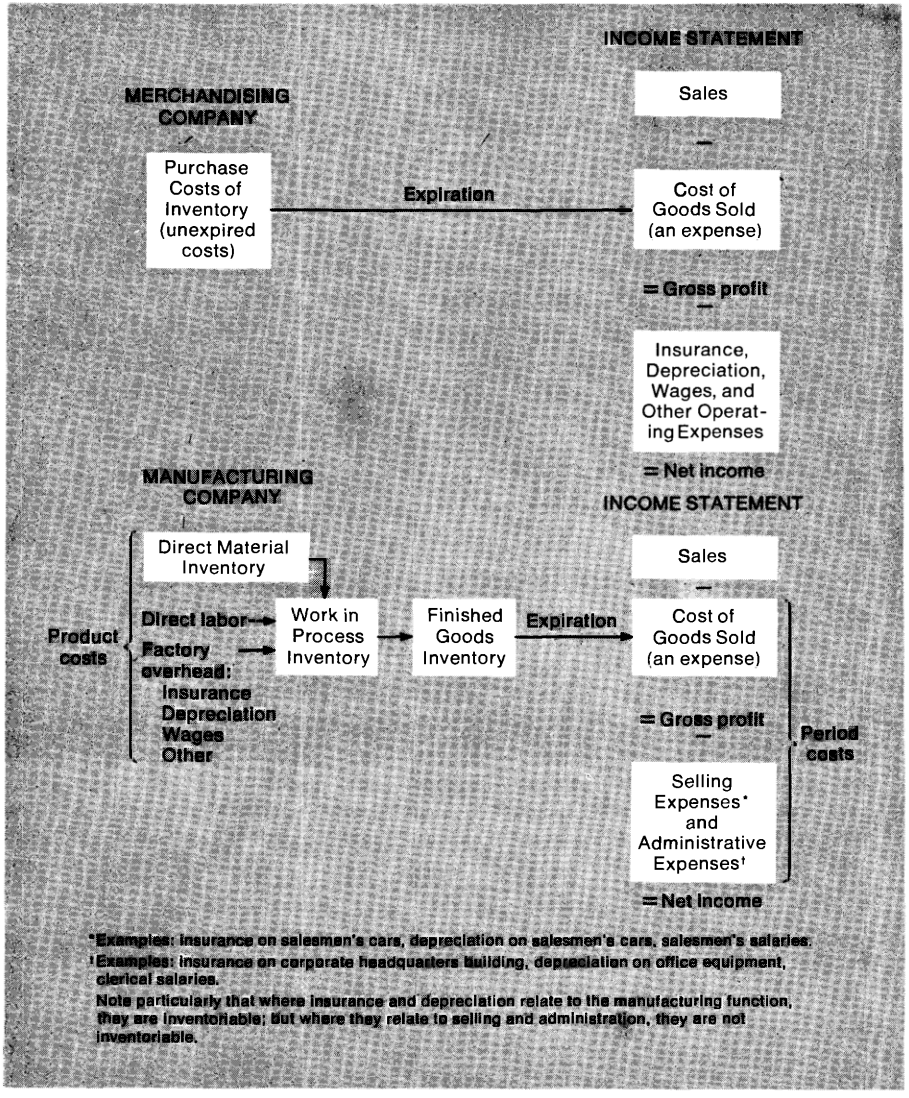
The schedule at the bottom of Exhibit 3-1 shows that the cost of goods manufactured is more complex to determine than is its counterpart, purchases, in a merchandising operation. Two kinds of inventory not present in merchandise operations enter into the costs of goods manufactured—partially manufactured product (work in process) and inventory of materials to be used in manufacturing the product. The manufacturer incurs costs of labor and services in converting purchased materials and components into finished products for sale. Thus costs associated with units of merchandise are primarily purchase costs incurred by the merchandiser, while costs associated with units of product are composed of costs of materials, labor, and manufacturing overhead incurred by the manufacturer. The labor and manufacturing overhead costs are often described as the manufacturer's conversion costs.

Reliance on Periodic Physical Inventories

Many small and medium-size merchandisers match merchandise costs with sales revenue through a combination of recording purchase costs in aggregate amounts and maintaining a method of identifying unit costs of merchandise with which to price periodic physical inventories of merchandise on hand. That provides all the data underlying the periodic determination of cost of goods sold as illustrated in Exhibit 3-1. Estimated inventory amounts are used in calculating

EXHIBIT 3-2

Relationships of Product and Period Costs



Source: Charles T. Horngren, *Cost Accounting: A Managerial Emphasis,* Third Edition © 1972. Reprinted by permission of Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

cost of goods sold for interim periods between physical inventory dates. Similarly, the cost accounting processes of many small and medium-size manufacturers consist primarily of maintaining a bank of cost accounting data necessary to develop cost factors needed for compiling unit costs of items on hand in periodic physical inventories of materials, work in process, and finished products.

Larger and more complex merchandisers and manufacturers usually record merchandise and manufacturing cost accumulations and transfers through appropriate inventory accounts during a fiscal year, as illustrated in Exhibit 3-2. The transfers to the cost of products sold accounts represent compilations of calculated unit costs of the merchandise or finished products sold. However, even if recording cost and inventory transfers is practicable, the results of interim compilations are considered to represent a tentative cost of products sold that will have to be recomputed at the end of the fiscal year or such other dates as physical inventories are compiled.

Therefore, regardless of the degree of sophistication involved in an enterprise's cost accounting procedures, its final cost of products sold for a fiscal year represents the accumulation of all the merchandise costs or manufacturing costs carried over in the beginning inventories and incurred during the year reduced by that portion which is appropriately allocable to the quantities of merchandise, materials, partially finished products, and finished products on hand at the end of the year. Describing it in income statements in those terms would be much more informative than the conventional caption "cost of products sold."

Conclusions

My review of practice indicated that periodic proof of physical inventory quantities is essential to producing reliable accounting data from which to match costs and revenue. I found that periodic establishment of inventory quantities is accepted as the point from which to calculate the accounting basis of inventory amounts entering into the determination of cost of goods or products sold during a fiscal year. I found also that management places considerable emphasis on the need for developing reliable accounting data from which to identify costs with items on hand.

The foregoing findings lead to my acceptance in principle of the opening statement on inventories in Chapter 4 of *ARB 43*, which reads:

> WHENEVER THE OPERATION of a business includes the ownership of a stock of goods, it is necessary for adequate financial accounting purposes that inventories be properly compiled periodically and recorded in the accounts. Such inventories are required both for the statement of financial position and for the periodic measurement of income.

4

Environmental Influences

Introduction

My review of practice confirmed the assumption that management considers the periodic compilation of physical inventories as an essential element in producing reliable accounting data from which to match costs and revenue for general financial reporting. Management attaches considerable importance to maintaining effective procedures for establishing inventory quantities, and reliable means of identifying unit costs of the items included in periodic physical inventories are considered necessary under the general accounting procedures employed.

The conceptual analysis of inventories in Chapter 2 uses an individual venture to illustrate the problems of matching costs of products with sales revenue and also serves to show the extent to which management must rely on unit cost data in planning, monitoring, and reporting on its profit-directed activities. I find this to be true in practice and find also that the development of the underlying cost accounting data is influenced greatly by the environment in which it is developed. The environment and the extent of its effect on accounting vary according to factors such as the type of operations involved, complexity, competitive features, and the management techniques used in planning and controlling operations.

Certain conclusions that are basic to my final recommendations come from the strong correlation which I find in practice between cost determinations for general financial reporting and the cost data for other internal management uses.

Chapter 3 described the differences between the cost of goods sold concept in merchandising operations and the cost of products sold concept in manufacturing operations. The same two broad functional

types of operations are dealt with in this chapter to discuss environmental influences on cost determinations for inventory pricing.

Merchandise Costs and the Merchandising Environment

Conventional accounting for merchandising enterprises follows the same simple conceptual approach identified in Exhibits 3-1 and 3-2. Merchandise acquired for sale is recorded at delivered purchase cost when received. The cost of the merchandise sold during a fiscal year is matched against the revenue derived from its sales. "Cost of goods sold," or "cost of sales," in the income statement of a merchandising enterprise represents the cost of the merchandise in inventory at the beginning of the year plus costs of merchandise purchased during the year less the cost of the merchandise on hand at the end of the year. All operating costs incurred during the year are conventionally accounted for as expenses of the year—classified functionally as to purchasing, advertising and promotion, selling, occupancy, and administration—and do not affect cost of goods sold.

Delivered costs of purchased merchandise received are generally identifiable as to unit costs with a minimum amount of averaging and allocating of incoming delivery costs. If units are large and readily identifiable throughout the merchandising process, specific identification of costs has intuitive appeal as the basis of accounting for cost of merchandise sold and for calculating the accounting basis of inventories on hand at the end of the year. That practice is generally followed in merchandising enterprises such as those distributing automotive equipment, farm equipment, art objects, expensive jewelry, furniture, and major household appliances. However, as unit volume increases and turnovers become more rapid, specific cost identification becomes impracticable, and a cost flow (such as first-in first-out) is assumed in calculating the cost of merchandise on hand at the end of the year. That procedure is commonly used by distributors of automotive parts and industrial supplies and by wholesale distributors of drugs, pharmaceuticals, liquors, and the like. At the far end of the cost identification spectrum for merchandisers is the large department store operation with a tremendous number of merchandise items in various departments, most of them sold in small quantities and at rapid rates of turnover. The concept of cost of goods sold is the same as that described above; only the *method* of application differs—the so-called retail inventory method, which is described in greater detail in Chapter 8, pages 121 to 125.

The economics of merchandising consists of buying products or goods and selling them at prices designed to provide margins above delivered purchase cost sufficient to yield a profit after covering all operating and administrative costs incurred in the functions of purchasing, storing, displaying, advertising, selling, and delivering the merchandise. Merchandisers continually plan and control their operations in terms of cost/price relations and merchandise turnovers. Traditionally, merchandising organizations are highly cost/price-oriented, and all functional aspects of the organization are considered a part of or support for the all-important sales function.

The foregoing conditions, combined with the relative simplicity of identifying costs of the merchandise sold, create an environment that leads to similarity of practices in determining the accounting basis of merchandise inventories.

Product Costs and the Management Accounting Environment

Manufacturing operations are usually chosen to illustrate the most complex of cost determination problems, as contrasted with the relative simplicity of merchandising operations. The complex case involves multiple-product manufacturing operations carried on in one facility.

The problem is to decide how much of an accounting period's continuing flow of costs should be considered to relate to partly finished product and how much to finished product on hand at the end of the period. The determination of costs for inventory purposes therefore involves the accumulation of data that will enable

> identification of those operating costs attributable to the manufacturing operations as distinguished from those attributable to other functional operations such as research and development, merchandising, general administration, and financing, and
>
> development of a means of periodically assigning the direct and indirect costs associated with manufacturing to inventory quantities of products and materials in various stages of the manufacturing process.

Cost Objectives. Determination of the accounting basis of inventory thus consists of something more than ascertaining the cost of acquiring an item to be sold. It represents only one of the cost objectives which form integral parts of the processes of accounting for

the overall production and merchandising functions of a manufacturing enterprise. The processes are frequently designated as cost accounting, production accounting, or, more appropriately, management accounting.

To be meaningful, the term *cost* must be qualified in terms of representing the cost of something. For example, it might be the cost of specific units of materials or products; the cost of certain types of production labor hours, machine hours, or departmental processing hours; the cost ascribable to the fulfillment of a cost-recovery-type contract; or the cost of entire activities or functions, in total or by components, for specified periods of time. Further, the composition of the "cost of something" has relevance only if associated with the purpose for which it is being used. This expands the qualification needed for the term to be meaningful so that it is stated as "the cost of something for the purpose of . . . ." The combination of the qualifications constitutes the cost objective for which the specific accounting determination of cost is developed. For example, the cost concepts and principles explored in this study are those underlying the development of *unit product costs for the purpose of determining the accounting basis of year-end inventories.*

Management Accounting. One of the most important general objectives of accounting is to provide a means of monitoring the results of management stewardship of the enterprise's profit-making activities. An essential element of the income determination process is the establishment of an accounting basis of inventories that results in the appropriate matching of costs and revenue. Management relies heavily on accounting as a primary source of information for planning, policy making, and administering the operations of an enterprise. Much of the data developed for internal management purposes is composed of or closely related to product cost determinations. Product cost determinations therefore represent an important source of accounting information useful in both internal and external financial reporting. Consequently, it seems natural that internal management accounting needs have had considerable influence on the establishment of cost concepts and principles and the methods through which they are implemented in both internal and external accounting uses. A clear understanding of the nature of the management accounting process and its environment is therefore essential to an appraisal of cost concepts and principles.

The accounting data that are probably of greatest importance in fulfilling multiple user needs are those reflecting results of operations.

The same accounting data, classified in segments reflecting functional responsibilities, provide the basis of budgeting control procedures for both revenue and related costs. The same fundamental accounting data, summarized in total (and sometimes in segments by industrial classifications of basic product lines), provide the basis on which management is judged with respect to overall responsibilities to the enterprise's owners and creditors.

The multiplicity of management uses of accounting data requires that the accounting processes have considerable flexibility to produce a variety of useful information. The accounting data used in management's reporting for external consumption are subject to requirements differing from those used for internal purposes. Management's general financial reporting to owners, creditors, and potential investors is subject to generally accepted accounting principles to provide needed assurance that the data have been prepared in accordance with appropriate ground rules. Reporting requirements of taxing and regulatory authorities may differ from those of generally accepted accounting principles, frequently as to format and presentation of data and sometimes as to basic concepts and principles. Internally, the accounting requirements are primarily those of providing information useful to management for planning, control, and administration purposes.

The accounting data required for many internal uses conform in concepts and principles with those in management's general financial reports. For example, the operational cost data reflected in general purpose income statements are used internally for cost control purposes by comparing costs of various functional activities with those planned as reasonably attainable at the levels of activity prevailing during the accounting period. Other internal uses require alignment of accounting data under concepts and principles differing from those for general financial reporting. For example, in planning pricing policies, the concept of unit product cost might include costs of development, marketing, and administration in addition to the conventional manufacturing cost used in inventory accounting for general financial reporting and for tax purposes.

Different accounting objectives generate varying degrees of emphasis on the relevance, verifiability, and completeness of data. The accounting process must provide for a wide range of analytical capability. Throughout the process, guides are needed to assure consistency of accounting within objectives and to provide completeness while avoiding duplication of cost assignments. Satisfactory fulfillment of

management objectives is accomplished only through structuring the accounting procedure as a rational, analytical information process carried out systematically over time.

Integrative Nature of Accounting. Many writers tend to consider general financial reporting as a function entirely apart from internal management accounting. Statements are made that practices appropriate for management accounting are not acceptable for general financial reporting. While this is understandable with regard to some methods and procedures, we questioned those interviewed as to whether it applies to basic concepts, such as the cost concepts and principles we are seeking in this study. Or, we asked, if material differences do exist in cost concepts for internal and external reporting, should they exist? Stated another way, would it be either logical or prudent for management to plan its profit goals in terms of cost concepts that are incompatible with the basis on which it must measure profit achievements in reporting to owners and other users?

The answer to all the questions was negative. Internal and external cost objectives are not incompatible—for example, allocation of direct and indirect manufacturing costs to products in relation to the relative extent that various products use the manufacturing capacities of an enterprise. The concept of determining identifiable quantities of productive materials and productive labor underlies product cost determinations for whatever purpose they may be used. Likewise, I find no conflicts in eliminating gross abnormalities in costs to calculate unit product costs for other uses. I find only one instance of basic conceptual difference—namely, the view held by some that indirect manufacturing expenses, or certain fixed elements of those expenses, should not be allocated to unit product costs for inventory purposes. Naturally, there are differences in the types of cost factors applied for varying cost objectives—historical costs for inventory, current or projected costs for cost/price planning, marginal or opportunity costs for special decisions, and the like.

The conclusions in the preceding paragraph are the same views expressed by accounting executives throughout our discussions of basic cost concepts. Accounting executives thus generally reject the notion expressed by many theorists that financial reporting should not rely so heavily on management judgment and that reliance on judgment should be reduced through providing greater objectivity to accounting principles and establishing more criteria for the use of alternative procedures available to managements.

Many writers recognize, however, even as does the APB in *Statement 4,* that a great deal of exercise of judgment is inherent in financial reporting. Examples are accounting policies on depreciation, amortization, and obsolescence of properties, on recognition of possible losses on receivables, on tax allocations, and on areas such as segmental reporting of diversified enterprises. Closer to the subject of this study are normalization of cost elements and elimination of abnormalities in determining unit product costs, the selection of appropriate levels of capacity utilization for developing burden rates, and the concepts of market as used in lower of cost or market. While the examples of reliance on management judgment are generally accepted, few writers have examined overall management accounting and decision-making processes as integral parts of the entire accounting process.

An American Accounting Association committee notes the trend toward adopting an integrated view of accounting in remarks on the nature of internal accounting:

> Management accounting is the application of appropriate techniques and concepts in processing the historical and projected economic data of an entity to assist management in establishing plans for reasonable economic objectives and in the making of rational decisions with a view toward achieving these objectives. [Adapted from the report of the 1958 Committee on Management Accounting, *The Accounting Review,* April 1959, p. 210.]
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> . . . . . .
>
> The precise limits of management accounting and the extent to which its technology will expand are not readily determinable at this point in its development. There is no logical reason, however, why management accounting should be constrained by external reporting conventions of a past era. Neither should internal reporting be conditioned by the nature of the accountant's obligations to third parties or society in general except, of course, that the results arising from the decisions made using internal accounting information require disclosure and control—including such controls as may be required by social considerations. . . . The inclusion of projections within the scope of management accounting is fundamental and indeed is implied by the explanation and evaluation of alternatives as well as the bringing of new alternatives into view. This inclusion does not necessarily distinguish management accounting from external reporting and the two are in no way incompatible if accounting is well performed.[1]

[1] Committee to Prepare a Statement of Basic Accounting Theory, *A Statement of Basic Accounting Theory* (Evanston, Ill.: American Accounting Association, 1966), pp. 39-41.

In his critique of *APB Statement 4,* appearing in *The Journal of Accountancy,* November 1971, Yuji Ijiri considered a serious fault of that statement to be its failure to mention the control function of accounting as basic to financial reporting. Ijiri emphasized the importance of the function to all users of financial information because of the constraints it places on management in requiring proper recording of cost flows. For many years, generally accepted auditing standards have recognized the administrative controls concerned with operational efficiency and adherence to managerial policies as part of the internal controls on which the auditor relies in his examination of financial records. Increasing emphasis on the managerial aspects of the subject is shown by Horngren, who stated that cost accounting provides data for (1) planning and control of routine operations; (2) nonroutine decisions, policy making, and long-range planning; and (3) inventory valuation and income determination.[2] Welsch proceeded somewhat farther along this route.[3] He emphasized that the accounting system must be tailored to the special planning and control requirements of the enterprise as its first requisite as well as being organized to meet the diverse needs of other internal and external financial reporting requirements.

I have not, however, found any treatment of basic concepts and accounting principles that adopts an integrated approach fully, nor have I found writings that disagree with an integrated approach from either the theoretical or the practical standpoint.

Accordingly, all aspects of accounting are treated throughout this study as parts of a unified system of providing management and others with information necessary for informed judgments and effective decisions in carrying out responsibilities for resource allocation, investment decisions, planning, policy making, and administration. General financial reporting is viewed as only one of the objectives of the overall function of accounting. The entire system is considered as a bank of accounting data which is maintained to meet a variety of accounting objectives. The broad functional classifications of accounting data relating to operations are referred to sometimes as the core of management accounting data which is used primarily for analytical purposes

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[2] Charles T. Horngren, *Cost Accounting: A Managerial Emphasis,* Third Edition (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1972), Preface, p. xvii.

[3] Glenn Welsch, *Budgeting, Profit Planning and Control,* Third Edition (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1971).

in planning and control and which, in addition, provides the data underlying the accounting basis of inventories for general financial reporting.

Common Core of Data. Most of the accounting data required to meet general financial reporting objectives is also necessary for other management accounting objectives. The various objectives all deal with the basic elements of cost of products sold and the development of cost factors with which to price units of material, labor, and manufacturing overhead for unit product cost determinations. Accordingly, accumulation and classification of data recorded for management accounting purposes should not be considered a rigid, single-purpose system. Rather, its minimum requirement should be the development of the core of data necessary for a rational analytical process directed at enterprise operations and carried on systematically over time. The extent of the effort beyond that required to meet management's general financial reporting responsibilities depends entirely on the extent of management's use of accounting information in its planning, decision-making, and control processes.

40 **Range and Sophistication of Processes.** Basic concepts and accounting principles can be implemented by a wide variety of methods. In smaller, less complex manufacturing enterprises, in which cost flow can be estimated or otherwise determined satisfactorily, the core of management accounting data consists of direct material purchases and direct labor and manufacturing overhead costs on a relatively limited functional department or cost center basis. Much of the analysis needed for unit product cost allocations (direct labor rates and manufacturing overhead rates) can be compiled satisfactorily on work sheets. Costs of inventory can be computed by applying work sheet cost factors to the engineering specifications for materials requirements and estimates of the direct labor or machine hours used to allocate labor and overhead costs to the partly finished and finished products on hand. While the procedures often leave something to be desired from the standpoint of verification of inventory amounts, properly applied they can produce results in conformity with generally accepted accounting principles. In operations of that type, no useful purpose is served by refining the cost accounting procedures beyond those required to meet management's cost control needs and special cost accounting requirements. The same reasoning leads many to consider compilation of the interim cost of products sold as a secondary

rather than the principal objective of a well-devised set of cost procedures.

Even under many of the more sophisticated cost accounting procedures, the basic components of cost of products sold are accounted for in a manner so as to retain their identity in total for the year. The data are then available for supplementary cost analyses. They also provide an audit trail which may be needed at year end, when the validity of the interim figures for cost of products sold is finally determined through comparison with the figures for the year based on physical inventories. Many companies use inventory accounts for the aggregate materials, direct labor, and manufacturing overhead components of production costs in accounting for cost flow during the year rather than the conventional raw materials, work-in-process, and finished products inventory classifications which are important only for general financial reporting at the year end.

In between the simplest and the most sophisticated cost accounting procedures lie many variations of methods for determining cost of products sold for a year. Even the largest and most complex enterprises frequently use simple methods for certain types of operations such as foundries and continuous process departments.

An Illustration. While techniques of linear programming and mathematical model-building have increased the effectiveness of cost analysis, they have not significantly altered the nature or the dimensions of the underlying core of management accounting data. An excellent illustration of this was noted in a relatively small midwestern custom foundry having a reputation for fine quality product and service dating back many years.

In foundry operations, certain costs relate directly to the metal, others to the molding time and cleaning time. Small custom foundries usually keep their raw material under accounting control by maintaining continuous quantity records; they have no work-in-process inventory because each day's melt of metal is usually completed in finished castings at the end of the shift, and the finished inventory usually consists of little more than the castings from the day's melt. An accountant can therefore produce ending inventory figures almost any day of the week if the core of cost accounting data provides the data necessary to calculate current cost factors with which to price castings on hand. There is absolutely no need to cascade accounting entries through the records to transfer and allocate costs for general financial reporting. The system in the foundry I visited provides basic classifications ap-

propriate for calculation of cost factors, analysis of unit product cost, and maintenance of cost control in line with supervision.

I questioned how they price their product (custom casting requires continuing pricing of new products). Management responded by describing the time-sharing computer arrangement. The computer program was built around a model of the ideal combination for a day's melt from the standpoint of metallurgy, melting capacity, and the company's core-making and cleaning capacities. Management explained further that by planning its daily production a week in advance using the available order backlog, it achieves maximum efficiency of operations and favorable profit margins. The underlying cost/price techniques are simple. The model program contains the ideal production quantities extended at current cost factors and competitive sales prices that should produce the optimum profit for a shift. The effectiveness of the model program's implementation and the correctness of its cost factors can be validated at almost any time by applying old-fashioned elementary cost accounting procedures. The same procedures can be, and probably are, used by many large, complex manufacturing enterprises having similar types of operations.

Conclusion

The wisdom of management determines to a large degree the extent of refinement in cost analysis necessary to produce reliable unit product costs on which to base decisions. Product cost/price relations are the heart of the profit-making activities of business enterprises. Management must have confidence in the cost figures on which it bases pricing decisions. Management must also have reasonable assurance as to the conformity of its own data with cost principles generally accepted and employed in pricing decisions within the industry. Since the limits of management acceptability set the overall pattern of cost accounting techniques necessary for profit-oriented decisions, they also set the pattern of management accounting procedures basic to reporting results of operations.

5

Unit Product Costs in Manufacturing

Determining Unit Product Costs

This chapter discusses problems of developing unit product costs that underlie the accounting basis of inventories in manufacturing enterprises. The discussion is limited to manufacturing operations for two reasons. First, general manufacturing operations present some of the most complex problems of cost identification and allocation. Therefore if the basic concepts and principles applicable to manufacturing can be established, they can be related readily to other types of operations. Second, dealing with but one type of cost determination problem eliminates the need for digressions to relate the problem to other types of inventory costs.

Two types of problems are involved in determining unit product costs for inventories in manufacturing operations. First is the problem of *cost selection*—identifying or selecting which of the broad classifications of costs associated with a fiscal year's manufacturing operations should be ascribable to unit products. Second is the problem of *cost assignment*—attaching the costs to products by identifying cause with effect or by some other rational and systematic means. The complexities in the problems have long been recognized. It is noteworthy that in the early part of the century many writers on cost accounting subjects used the term *cost finding*, thereby indicating that the process is one of searching out data.

Discussions of the subject with financial executives and partners of accounting firms confirmed my original assumptions that diversities of practice exist in this area of cost accounting and result in applying

differing accounting treatment in similar circumstances. The subject has therefore been studied to determine whether diversities exist as a result of failure to conform with principles or because the principles permit them. The conclusions are that a need exists to improve understanding of the principles underlying unit product cost determinations and to provide better guides for their use.

Discussions in this chapter place primary emphasis on development of unit product costs for use in pricing year-end inventories entering into the compilation of cost of products sold. The framework for the discussions is provided in the descriptions in Chapters 3 and 4 of the conceptual nature of cost of products sold and of how the environment of management accounting influences cost determinations.

Authoritative Principles. Chapter 4 of *ARB 43* contains little from which to identify fundamental cost concepts and principles relating to determinations of unit product costs. *Statement 3* of that chapter (Appendix A, page 159) states that "cost means in principle the sum of the applicable expenditures and charges directly or indirectly incurred in bringing an article to its existing condition and location." The discussion following the statement enlarges on it, explaining that cost is understood to mean acquisition and production cost. The discussion then goes on to say: "Although principles for the determination of inventory costs may be easily stated, their application, particularly to such inventory items as work in process and finished goods, is difficult because of the variety of problems encountered in the allocation of costs and charges."

The discussion also contains the following assertions which suggest important cost concepts:

> *[Abnormalities]* . . . under some circumstances, items such as idle facility expense, excessive spoilage, double freight, and rehandling costs may be so abnormal as to require treatment as current period charges rather than as a portion of the inventory cost.
>
> *[Selling and Administrative Expenses]* . . . general and administrative expenses should be included as period charges, except for the portion of such expenses that may be clearly related to production and thus constitute a part of inventory costs (product charges). Selling expenses constitute no part of inventory costs.
>
> *[Manufacturing Overhead]* It should also be recognized that the exclusion of all overheads from inventory costs does not constitute an accepted accounting procedure.

The discussion concludes with the observation:

> The exercise of judgment in an individual situation involves a consideration of the adequacy of the procedures of the cost accounting system in use, the soundness of the principles thereof, and their consistent application.

APB Statement 4 contains about the same limited description of inventory cost but omits specific mention of abnormalities and selling and administrative expenses. The expense recognition principle of associating cause and effect (Appendix B, page 176) is followed by this description of cost principles:

> Several assumptions regarding relationships must be made to accumulate the costs of products sold or services provided. For example, manufacturing costs are considered to "attach" to products on bases of association such as labor hours, area or volume of facilities used, machine hours, or other bases presumed to indicate the relationship involved. "Attaching" costs to products often requires several allocations and reallocations of costs. [Paragraph 158]

The same broad principle is referred to again in the discussion following a statement of the basic principle on measuring costs of manufacturing products and providing services (paragraph 184, M-6A). The specific principles (S-6A(1) and M-6A(1)) state briefly that product costs are determined by assigning direct and indirect costs of manufacturing products and providing services which are considered "productive" to units of product and service "in a rational and systematic manner."

Need for Additional Documentation. Those statements fail to provide as much guidance as is needed. For example, what is meant by costs that are "productive"? Are some costs of manufacturing not assigned to units of product? How does one determine which costs are "so abnormal" as to warrant exclusion from unit product cost calculations or establish the capacity utilization levels above which costs become "idle facility expense"? If exclusion of all overhead is unacceptable, how much exclusion is acceptable?

Review of the literature reveals that much of the writing on cost accounting for manufacturing enterprises has dealt with methods of implementation in specific circumstances rather than with basic concepts and principles. The volume of such writings, however, bears witness to the importance of cost analysis as a keystone to management

of profit-directed activities. Nowhere else in the financial accounting process is it more evident that

> Generally accepted accounting principles are conventional—that is, they become generally accepted by agreement (often tacit agreement) rather than by formal derivation from a set of postulates or basic concepts. The principles have developed on the basis of experience, reason, custom, usage, and, to a significant extent, practical necessity. [*APB Statement 4*, Paragraph 139, reproduced in Appendix B]

They are conventional—that is, sanctioned by or growing out of custom or usage. Our review of the writing and of practice has led to the conclusion that a number of well-defined basic concepts and principles have been developed in this manner and have been generally accepted for many years in the determination of unit product costs for general financial reporting. Those concepts and principles are directly related to the two major types of problems involved in determining unit product costs of manufacturing—cost selection and cost assignment.

Cost Selection

Relevance. These are the initial questions: Which costs are applicable to the processes involved in bringing an article to its existing condition and location? What principles govern the separation of the costs associated with the manufacturing processes from those resulting from nonmanufacturing activities? Answering these questions has been described by many writers as a process of determining cost ascribability or cost relevance. The term relevance generally implies a close logical relationship with and importance to some thing or objective. It has the same meaning in cost accounting. *APB Statement 4* establishes relevance as the primary qualitative objective of all financial accounting—relevant information is information that bears on the economic decisions for which it is used.

William J. Vatter made these observations on cost relevance for determining unit product costs:

> Relevance of a cost computation depends not only upon a clear specification of the cost objective, but also upon a set of criteria for determining what part of the available data is to be assigned to or associated with the cost objective. Most people would agree that a cost is assignable to a given cost objective if the action

> which gave rise to the cost had the effect of increasing, improving or furthering the completion or achievement of that cost objective. This suggests that there is some aim or purpose to which the incurrence and measurement of cost is related; the relevance of cost to a given cost objective is determined by that purpose which cost is to serve.[1]

If a principle underlies the selection of costs applicable to manufactured products, it appears to be involved in the cause and effect relationship of costs and revenues. The causes are actions taken to manufacture products or to maintain the facilities and organization to manufacture products. The effects are the costs.

Writings on cost relevance sometimes describe a concept of benefits received as a basis for selection and assignment of costs to activities and products. Vatter rejected that concept on grounds that measuring relative benefits seems to require judgmental decisions involving equity. He concluded that cost assignments are not ethical or moral processes but are measurements and should be carried out by objective and logical methods. I concur in that view and consequently avoid the term cost benefit throughout this study in favor of expressing cost relevance in terms of fundamental cause and effect relationships.

Costs of Functional Activities. Identification of costs with activities and purposes may be accomplished through various bases of association. *Kind* or *type* of cost often provides identification with a kind or type of activity. For example, purchase costs of raw materials and cutting oils identify with production activities; sales commissions identify with marketing. Similarly, the *location* of cost incurrence may help in identifying it with an activity; for example, manufacturing plant costs with production activities and warehousing of finished product with marketing. The *purpose* of an activity sometimes provides a guide to separating production costs from other costs; for example, supervising installation and subsequent trouble-shooting for customers may be a marketing activity whereas setting production standards and revising product specifications are production activities, yet both may be performed by personnel from an engineering de-

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[1] "Standards for Cost Analysis," a Research Report, appearing as Appendix VI to *Report on the Feasibility of Applying Uniform Cost-Accounting Standards to Negotiated Defense Contracts*, by the Comptroller General of the United States to the Committee on Banking and Currency, House of Representatives, 91st Congress, Second Session, January 1970, p. 511.

partment. Consideration of all the various relationships between costs and activities aids in developing rational classifications of costs.

As explained in Chapter 4, identification of functional activities provides the essence of cost control through classification of costs according to management lines of responsibility for cost incurrence. Association of costs with functional activities is a predominant factor throughout management accounting cost analysis for both internal and external reporting, as is apparent in conventional broad functional classifications of costs and expenses such as costs of products sold, selling and advertising expenses, general and administrative expenses, and research and development expenses.

The prevalence of functional associations of costs and expenses suggests the existence of a cost accounting concept that underlies practically all detailed principles governing cost and expense association for purposes of income determination.

Costs Associated with Manufacturing. Matching a year's manufacturing costs with revenues is a multiple step process. Cost analysis initially identifies the costs that should be associated with the manufacturing functions. The process next determines the costs that should be considered costs of the year, then ascertains which of those should be allocated to products manufactured, and finally segregates the year's product costs between those related to products sold and products on hand at the end of the year.

Present authoritative pronouncements provide incomplete criteria for determining the costs that should be included or excluded from manufacturing costs. Certain types of costs are clearly associated with nonmanufacturing functions and can be identified through other direct cause and effect relationships with the period in which they are incurred. Examples are selling costs that can be related directly to sales and delivery of specific products. Many other types of costs cannot be as clearly dissociated from the manufacturing functions and lack characteristics that provide reasonable means of directly or indirectly aligning them with any period other than the one in which they are incurred. Many costs of general administration and research are examples of costs that have conventionally been recognized as expenses of the period in which incurred, on the reasonable expectation that the cost of attempting their allocation to specific types of revenue or among several periods would outweigh the benefits. This idea is stated authoritatively as one of the three pervasive expense recognition principles in *APB Statement 4.*

Conventional practice. The general expense classification process has long been applied on a broad functional classification basis rather than by considering detailed costs separately. All costs associated with the selling function—both direct and indirect—generally have been considered expenses of the period in which incurred, as have costs associated with the functions of general administration, finance, and general research. That does not mean that a logical basis does not exist for allocating those costs to broad segments of the activities or broad product lines as part of the overall costs of developing, producing, and marketing the enterprise's products. Allocations are frequently made for operational planning purposes, for cost-recovery-type contracting, and for segmental reporting of income. Practice has determined, in effect, that because the costs of general nonmanufacturing functions are of a regular and recurring nature, their allocation among several accounting periods by assigning them to unit product costs would serve no useful purpose in income determination.

The reasoning involved is not, however, entirely arbitrary. Few people argue against the concept of considering selling costs as expenses because the selling function is so largely one of marketing products currently. Administrative expenses are more of a problem. There is little argument against including the costs of factory administrative functions in indirect manufacturing costs of the year. They are costs that would not be incurred if the enterprise did not regularly maintain the facilities and organization to manufacture its products. That is not true, however, of the costs of a general administrative function that encompasses the overall planning and coordination of policies for the development and financing of the acquisition of products for marketing. Those functions would be carried on much the same whether the enterprise manufactured or purchased its product, as noted in my conceptual analysis at page 23. Accordingly, it seems logical to exclude general administrative costs from manufacturing costs and include them in a broad group of period expenses consisting of the regular recurring costs of administering all functions essential to the enterprise's total profit-directed activities.

Diversities in practice. It is often difficult to distinguish clearly between manufacturing and nonmanufacturing functions if, for example, engineering department activities include new product research and production engineering on present products. Problems arise in classifying costs associated with the functions of purchasing, warehousing, personnel, data processing, and the like. The diversity of practice in

those areas usually results from practical solutions to difficult classification problems. Our review of the subject with industrial accounting executives and technical partners of large accounting firms indicated that those diversities of practice are not a significant cause of lack of comparability in financial reporting between companies.

Conclusion on Cost Selection. Evidence indicates that practice has been fairly sound in implementing the present broad principles underlying the segregation of costs between manufacturing and nonmanufacturing activities. A comprehensive description of manufacturing costs is desirable, however, to provide the basis for principles underlying determinations of unit product costs. A useful description is included at the end of this chapter after the reasons for some of its language are developed in the following discussions on unit product costs. It incorporates the concepts of functional classification of costs and the principle of excluding from manufacturing costs all costs associated with an enterprise's general research, selling, general administrative, and financing functions.

Manufacturing Cost Assignments

Reliable, current information on production costs is essential to operating management for a wide variety of purposes, one of which is inventory pricing. Accordingly, determining unit costs of products during various production periods is, in effect, a continuing process in manufacturing operations. Many factors affecting the compilation of costs for inventory pricing are reviewed annually (for reasons set forth in later discussions). Accordingly, the fiscal year is a logical period within which to discuss cost assignment problems.

Total Manufacturing Costs. Let us assume for discussion purposes that we accept the view in *ARB 43*, Chapter 4, that inventory costs should not include (1) idle facility costs and (2) certain costs considered to be abnormal (page 44). The rationale for the exclusions is discussed later in terms of the practical problems of normalizing direct costs and of selecting appropriate levels of productive capacity for overhead rate determinations.

We might state then that the manufacturing costs of a fiscal year that form the total pool for unit cost assignment are selected on this principle:

> In determining unit product costs to be used in arriving at the accounting basis of inventories, all elements of cost asso-

ciated with the manufacturing activities of an enterprise are to be considered relevant to product costs except to the extent that they represent (1) costs of idle excess productive capacity or (2) costs that are so abnormal as to preclude their ascribability to units on hand. Unascribable costs are considered to have expired and thus are expenses of the period.

Cost Assignment Rationale. Costs comprising the total pool of manufacturing costs share the common characteristic of being incurred for functions necessary to carry on the manufacturing activities of the period. Unit product cost determinations rely on that relationship in seeking ultimate cost identification with the products manufactured during the period. The basic cause and effect notion of cost relevance underlies the entire process. The manufacturing process caused the cost, so the cost is relevant to the output of the manufacturing process. The first step away from the total pool therefore might logically be to establish some identification of products with the production operations necessary to their completion. That part of the process should therefore establish the most visible cause and effect identifications between functions and products.

Identifying products with manufacturing processes leads to one of the basic concepts underlying the assignment of manufacturing costs to products—that of designating certain costs as direct and others as indirect. Direct costs are those that can be identified with products physically or by observing the production operations involved in their manufacture. All other costs are indirect. In general, direct costs include the materials forming an integral part of the product and the labor that can be observed as directly involved in the fabrication of the product.

Observable relationships exist between products and functions to a lesser degree for costs of other manufacturing functions. Some costs can be identified as originating in—or being caused by—or controlled by specific production operations (such as the costs of cutting oils, tools, power, and equipment used in fabrication of specific products). One step further removed from direct identification are costs originating in or controlled by other functions that house, service, and manage the manufacturing functions. Those include costs involved in materials handling and storage, tool rooms, repair and maintenance, personnel and payroll departments, building maintenance, and factory administration. Those indirect functional activities are all clearly visible as part of the activities necessary to carry on the manufacturing function.

Soundness in applying the basic functional cause and effect relationship for cost accounting purposes is a primary indication of the extent to which an enterprise employs rational, analytical processes in assigning costs to units of product.

Differentiating Principles and Implementation. If this study is to achieve its purpose, emphasis must be placed on the fundamentals that underlie cost determination—fundamentals that apply regardless of the specific method or procedure in use. The application of the fundamentals, however, may require the adoption of certain practices under certain conditions. Thus there is an interrelationship between the fundamentals (concepts and principles), the situations and conditions in which they are to be applied, and their implementation through methods and procedures. Three conventional methods of cost determination are referred to throughout this study: (1) specific product costing or job costs, (2) process costs, and (3) unit product cost standards or standard costs based on engineering specifications. Essentially, all are methods employed in practice to apply the same cost concepts and principles.

Specific product costing. Under the job cost method of determining unit product costs, direct materials and direct labor are identified with products as materials are used and labor is expended on specific jobs or batches of product. Costs are accumulated for and controlled through job order or job lot recording procedures. As products move through the various manufacturing processes, indirect costs are allocated to various jobs on the basis of rates applied to appropriate measures of production activity, such as labor hours and machine hours.

That method of unit product cost determination is used predominantly by enterprises engaged in manufacturing large items of heavy equipment, such as aircraft, railroad cars, and machine tools, and in cost-recovery-type contracting. Job costs are also used in general manufacturing operations to accumulate product costs on special orders, short runs, nonstandard or experimental products, and other custom-designed production. The method is seldom used on large-scale production of standard design items.

Process costs. The process cost method of determining unit costs uses a broad type of calculation for production in continuous process operations. In its simplest form, the method consists of dividing the total manufacturing costs of a plant or department for an accounting period by the usable units processed in the period. Its broad aver-

aging approach is also adapted to many complex processing situations by providing for factors such as varying yields, erratic cost behavior patterns, and joint products or by-products. The method is used in many extractive industries and in some manufacturing processes for basic metals, chemicals, drugs, glass, cement, and the like. Process cost methods are also used extensively to determine unit costs for production operations such as plating and heat treating.

Unit product cost standards. Many writers on cost accounting subjects emphasize the use of unit cost standards for purposes of management cost planning and cost control. It is generally agreed that cost standards can be highly effective for this purpose. In addition, standards provide an economical method of obtaining meaningful unit product costs both for interim financial reporting and for determining the accounting basis of year-end inventories. The advantages encourage the wide use of unit cost standards that are reviewed and revised regularly.

Unit cost standards are usually based on reasonably attainable product costs for the period for which they are computed. Direct materials and direct labor components represent engineering specifications of quantities priced at planned attainable unit costs. Manufacturing overhead costs are compiled on a basis of rates appropriate for the production activity of the period, including provisions for costs attributed to normal amounts of waste, spoilage, and unavoidable direct labor losses not provided for in direct labor standards.

The standard cost method of determining unit product costs with varying degrees of refinement is probably used more widely in general manufacturing operations than any other cost accounting method. In addition, the cost standards concept is used for applying overhead (and sometimes direct materials and labor) in both job and process cost methods.

Direct Manufacturing Costs. The terms *direct materials* and *direct labor* appear frequently throughout cost accounting language. The basic principle of identifying costs of direct materials and direct labor in the accounts of manufacturing enterprises and in calculations of their product costs is recognized almost universally in teachings, writings, and practice of cost accounting. I believe that the recognition of direct costs is a fundamental concept that should be acknowledged authoritatively as one of the broad operating principles of cost determination.

Applicability. Broad principles must be considered in relation to the combinations of circumstances under which the principle does or

does not apply. Must it always be implemented? What are its limitations, if any?

Identification of direct materials and direct labor as separate elements in continuous process operations is *not* always considered a requirement of valid cost analysis. The amounts in terms of units may be so infinitesimal as to limit the usefulness of direct cost identification for analysis purposes even though certain materials and labor might be observed physically as integral parts of the finished product. However, direct materials and direct labor costs generally represent significant portions of the manufacturing costs of many products and are major factors in management's planning and control of costs.

A statement of a direct cost principle should make it clear that identifying direct cost elements may not be practicable in some cost analysis situations. If significant, however, I believe direct materials and direct labor should be accounted for as separate components of product costs.

Problems in selecting quantity and price factors for direct costs. Specific identification of the exact materials and direct labor costs applicable to units of product on a one-for-one basis is rarely practicable since materials and labor are usually acquired and accounted for in quantities differing from unit product requirements. For this reason, components of unit product costs are discussed throughout this study in terms of both the quantity and the price (or cost factor) that make up the cost. That approach is basic to almost all cost analysis.

Problems of correlating the quantities required for production with the cost factors at which to price them are relatively simple for direct materials and direct labor. The quantitative unit selected is the one that most logically measures the quantity requirements and corresponds with the conventional unit pricing basis. The same logic applies to the selection of units for measuring cost of direct labor required by the various production operations. In selecting units of measurement for both direct materials and direct labor, consideration is usually given to possibilities for batching or pooling and for normalizing the cost elements to avoid erratic cost behavior patterns in both the quantities and the unit costs. The most useful basic data for analytical purposes are usually the quantity of materials and labor required under ordinary operating conditions.[2]

[2] A theoretical question frequently raised in discussing cost concepts is whether it is necessary to distinguish between direct and quasi-direct materials and labor. Since the question is one of the degree of precision to be achieved in cost measurement methods, it is omitted here as not basic to broad principles.

Normalizing Direct Costs. Many writers on cost accounting have recognized the need to compile product costs on bases that provide for elimination of abnormalities so that losses due to avoidable wastes and extraordinary operating conditions become part of the expenses of the period in which they occur and not part of the costs of inventories.

The practical cost accounting solution is to identify and eliminate costs of abnormalities at the point of incurrence, if possible, to keep them out of the cost flow entering into unit product cost determinations. William J. Vatter recognized the problem in this way:

> Underlying all cost calculations there is the idea of a rational minimum. Outlays which exceed the amount *really* necessary to achieve the desired result are not regarded as costs of that result. Any excessively high cost would be regarded as either a loss (cost which produces no useful or desirable result) or as a waste (cost which could have been avoided by exercise of typical or expected foresight).[3]

Normalizing costs is common in practice. As will be seen in later discussions, manufacturing overhead rates are conventionally compiled on predetermined annual bases and include an average, or normal, amount of costs that fluctuate seasonally or over production cycles. Also, the bases of measuring production activity are established at levels of utilization that recognize the cost of unused excess capacity as part of the expenses of the period in which the condition exists. Those practices and the basic concepts underlying them represent an impressive and formidable array of logical and systematic matching of costs and revenue in a manner that effectively avoids deferring abnormal costs to future periods.

The word normal is used in cost accounting to mean just what it means anywhere else. Normal performance is generally considered to conform with an acceptable standard of achievement, a level known to be reasonably attainable under ordinary operating conditions. A normal price for materials is the going market price paid to usual sources of supply for the usual lot-size quantities purchased. Normal direct labor costs are the hours required at reasonably attainable

[3] "Standards for Cost Analysis," a Research Report, appearing as Appendix VI to *Report on the Feasibility of Applying Uniform Cost-Accounting Standards to Negotiated Defense Contracts,* by the Comptroller General of the United States to the Committee on Banking and Currency, House of Representatives, 91st Congress, Second Session, January 1970, p. 508.

levels of production efficiency priced at average hourly rates for the labor skills ordinarily required.

The elimination of abnormalities from unit costs is a basic part of recording cost by the method of unit product cost standards. Many job cost and process cost procedures incorporate elements of the standard cost procedure for the same purpose. If cost procedures do not specifically purge abnormalities from the stream of cost flow, management accounting usually provides for a review of unit product costs for this purpose in arriving at the accounting basis of year-end inventories.

The process has great intuitive appeal. No useful purpose is served by bequeathing to future periods production costs that represent losses due to abnormal wastes and extraordinary operating conditions. I believe that authoritative pronouncements should continue to recognize the abnormality concept but should expand the description of it to provide guides for its implementation.

Allocations of Overhead Costs. The aggregate costs associated with manufacturing activities of an accounting period, exclusive of those classified as direct costs, constitute the period's indirect manufacturing costs, commonly termed manufacturing overhead or manufacturing burden. The assignment problem posed by the overhead costs is one of allocating to the products manufactured during the period those costs that are not considered to be abnormal or to represent cost of idle excess capacity. Allocations are accomplished in most manufacturing operations through the development of overhead rates designed to link overhead costs with products in proportion to the extent to which the products use or consume the manufacturing facilities represented by the costs.

Present APB pronouncements, as noted on page 45, provide little guidance as to basic concepts and principles underlying the cost allocations. Our review of cost accounting literature and our discussions of the subject with accounting executives and technical partners of large accounting firms disclosed significant controversial issues and diversities of practice in the area.

Characteristics of overhead costs. Allocations of manufacturing overhead costs to unit products are difficult to justify in specific terms since the costs lack the physical identification with products that is possible for direct materials and direct labor. The costs that make up the total pool of manufacturing overhead have a variety of characteristics related to:

1. Kind or type—indirect labor costs (such as supervision), payroll taxes, small tools and supplies, power and light, depreciation, property taxes, insurance, etc.
2. Periodic cost behavior patterns—those varying generally with changes in volume of production (variable) and those not so behaving (fixed), such as depreciation and property taxes.
3. Function—origin or control by producing centers performing manufacturing operations and processes; service centers, such as those for the repair and maintenance of equipment in the producing centers; and other functions such as those relating to occupancy and general manufacturing administration.
4. Location and line of responsibility for incurrence and control within the manufacturing organization.

All four classifications have some bearing on the selection of bases for allocating overhead costs to functions and ultimately to the variety of products that use the various production facilities.

Underlying data. Classification of the accounting data necessary for rational analytical overhead cost allocation must be tailored to the requirements of individual manufacturing enterprises. The essential classifications of data for that purpose relate to the above cost characteristics. A logical classification of overhead costs by kind, which permits identification by function, location, etc., also permits analysis according to variable and nonvariable or fixed cost characteristics.

The cost analysis process also requires the accumulation of certain nonmonetary data to facilitate the assignment of both direct and indirect manufacturing costs to products. Current engineering specifications of required materials and manufacturing processes are essential to analysis and assignment, as are procedures for reporting and compiling statistical data on materials usage, scrap and spoiled work, direct labor hours and machine hours expended in production operations, and the production completed at various stages of the manufacturing processes.

Criteria for overhead allocations. The rationale underlying overhead cost allocations, as explained on pages 51 and 52, is essentially one of establishing relationships between the indirect manufacturing activities and those functions more directly identified with

the products. The amounts of direct materials, direct labor, machine hours, etc., consumed in production operations usually provide reliable bases for measuring the relative extent to which various products utilize the producing facilities. The same measurements yield logical statistical bases to relate direct producing activities with the supporting organizational functions and facilities. The questions are, What criteria indicate relationships between costs incurred in the supporting functions and facilities? and To what extent do the various products consume or use the manufacturing capacities?

In terms of the basic cause and effect cost concept, the most causal relationship between functional activities and cost incurrence is the most logical basis for measuring the extent to which manufacturing overhead costs should be allocated to the various products. That provides the broad framework within which overhead rates are structured.

Overhead rate structure. The development of manufacturing overhead rates is influenced by the planning process. It involves continual planning and review of the rate structure needed to achieve objective and analytical assignment of indirect manufacturing costs to various products. Appropriate treatment of fixed cost elements in terms of their annual relationship to volume necessitates the understanding of normal volume expectations from year to year. Both internal and external reporting require cost assignments on a timely, reliable basis. Those features of cost accounting have resulted in the acceptance of annual, predetermined overhead rates.

Activity measurement basis. Correlation between the statistical bases measuring production activities and pools of indirect costs is essential to appropriate overhead rate development. Conventional bases of measurement include direct labor hours, direct labor dollars, and machine hours. Weight, surface area, bulk, and the like, are also used in process-type operations. In the early days of cost accounting, the amount of direct labor dollars provided a convenient measure of activity because payrolls were generally identified and controlled in terms of functional departments.

Refinements in cost accounting techniques led to more use of labor hours, which provide a more flexible basis for recognizing changes, etc. The use of hours also permits normalizing premium labor rate costs and so-called fringe benefit labor costs. Machine hours often yield logical measurements of production department activity. If highly automated equipment is involved, labor hours per unit of product may be too small to represent a practical unit of measurement.

In process-type operations, activity measurements may be based on any one of a number of ways of identifying product usage of facilities such as weight or bulk. The objective in measuring activities is to find a convenient and reliable indicator of usage. Sometimes, a combination unit of measurement is developed, such as the time and space occupied by a one-pound loaf of bread in a bakery's oven.

Establishment of cost pools—departmentalization. The classic cost accounting illustration of the one-plant, one-product situation is often used as the starting point for discussion of overhead allocation. An overall plant overhead rate per unit of product in the simplified case appears to meet all tests of validity and practicability if adjusted for abnormal work stoppage costs and if, as pointed out in Chapter 2, due consideration is given to the fixed cost relationship to planned capacity utilization. The introduction of a second product, however, requires the selection of a base other than the number of units produced to measure the extent to which each of the two products uses or consumes the plant facilities.

Different production operations create different problems in developing applicable cost analysis. The differences generate a need to consider the number of cost pools necessary to obtain the most practical overhead rates and the desired degree of reliability of results. For example, in metal working, significant operational differences usually exist between the initial forming operations, the intermediate machining and finishing of components, and the subassembly, final assembly, and packing operations. Initial forming may in itself include significant differences in type of processing and type of cost behavior. Sheet metal cutting, trimming, and forming, for example, can be performed on relatively inexpensive equipment, requiring relatively low labor skills. Forming bar stock calls for relatively more expensive equipment, such as lathes, planers, and milling machines, and more highly skilled operators. Sometimes expensive, highly automated equipment combines many of the operational functions of simpler equipment. The same is true of the differences that exist within the intermediate and finishing operations and the assembly operations. In addition, many manufacturing plants have plating, heat-treating, and highly automated painting departments which function on a process cost basis. Woodworking operations, working with plastics, food processing, and much of general manufacturing provide similar allocation problems.

Production departments. The foregoing differences in types of processing result in differing production cost behavior patterns that

are related directly to the organizational philosophy and management control techniques of the companies concerned. They appear in the departmentalization of plants in which equipment and manufacturing functions are organized under management lines of responsibility. It is within production operations that one can observe the direct materials being physically consumed in product and the direct labor being physically applied to units of product. The identifiable production departments provide the basis for the accumulation of costs incurred in their functional operation to create a pool of indirect costs. Statistical measurements of production activity provide the basis for allocation to units of product. The identification of products with the basic functional processes and the discovery of statistical measures of utilization are essential to rational allocation of indirect manufacturing overhead costs.

Departmentalization of the producing functions usually simplifies the cost allocation problems of general manufacturing operations. It is relatively easy, for example, to establish the relationship between certain types of indirect cost specifically incurred within production departments and the output of those departments. Salaries of executive and clerical workers as well as wages of certain indirect or nonproduction workers in the departments can be charged directly to the department pool, as can overtime and shift premiums and vacation and holiday pay of the direct labor workers in the department. Payroll taxes, pension costs, and the like, can be distributed accurately to the departments on the basis of employees' wages. Many of the indirect costs which are not incurred specifically in the producing departments can be identified with them because the production departments originate, authorize, or control the incurrence of costs of service departments.

Indirect departments. A broad group of manufacturing overhead costs can be identified specifically with certain indirect or nonproductive functions and services necessary to the overall manufacturing activities. Examples are costs incurred in receiving, handling, and storage of raw materials and processed parts; general equipment repair and maintenance; tool storage; product design and engineering; production planning and control; personnel and labor relations; costs of maintenance and occupancy of buildings and grounds; and general manufacturing administration. In many situations the costs can be identified because functional departments occupy specific facilities in the manufacturing plants under specific executive direction. In other circumstances, it may be practical to identify the costs by func-

tional groupings only under a broad classification of general manufacturing overhead costs.

While all indirect costs discussed in this section are clearly associated with the overall manufacturing activities, they lack a clear-cut correlation with specific units of production. The conventional reapportionment of indirect factory service and administrative costs is based on grouping them in pools having (1) common functional characteristics and (2) correlation with some statistical base that at least approximates the relative extent to which the direct product cost elements or the productive departments consume the service or facilities provided.

For example, certain service departments are logically correlated with materials, such as the departments receiving, handling, and storing raw materials and components. If the pool of costs is a significant factor in unit product costs that may vary substantially between costs of various products, a materials handling overhead rate may be devised to assign the total pool of costs to units of product on the basis of quantities of materials consumed.

Other indirect costs may be pooled as people-oriented costs and allocated to departments on the basis of the number of people employed or the labor hours of direct and indirect workers in those departments.

Some functional costs are space- or occupancy-oriented, such as those relating to buildings and grounds, and can be allocated to productive departments on a basis of relative space occupied.

Conclusions on overhead allocation. The foregoing discussions have been presented in considerable detail to demonstrate that there is no absolute method of determining appropriate bases of overhead allocations to products. The governing principles are found in cause and effect relationships. The criteria for measuring the validity and effectiveness of allocations lie in the extent to which the methods employed reflect logical relationships between types of costs and statistical measurements used to trace them to points at which they can be identified with specific products.

The idea that costs of a given type have a common relationship to production activity and to products is sometimes called the homogeneity concept. For example, the absence of functional departmentalization and the use of an overall plant overhead rate would be unlikely to arrive at defensible unit product costs in an enterprise manufacturing a variety of products that differ significantly in types of manufacturing processes required. For many relatively complex

manufacturing situations functional cost identification can be determined for practical purposes by periodic cost analysis procedures.

Costs at Varying Levels of Capacity Utilization

Idle Facilities and Excess Capacities. Present practice governing unit product cost determinations provides that costs of idle manufacturing facilities should be considered period expense (page 44). Costs related to specific segments of idle excess plant facilities can be identified and isolated readily from other costs. The same is true of plant facilities idled in whole or in part for extended periods as a result of unplanned work stoppages. The cost identification problem becomes more difficult if operations are carried on regularly for extended periods at production levels significantly below those for which the facilities were planned. Costs can usually be separated in such cases through identification of the fixed and variable cost elements in the overhead rates.

The Idle Excess Capacity Cost Concept. The idea of not allocating costs of excess manufacturing capacity to production of the fiscal year is essentially the notion that they are costs of not producing and therefore should be expenses of the year in which the capacity is idle. Intuitively, one believes that increasing costs of products on hand to include excess capacity costs is unjustified. The belief is supported by arguments that manufacturing capacities are intended to satisfy long-range demand for products after considering seasonal, cyclical, and trend factors and therefore that capacity costs in excess of those required for long-range demand should not be allocated to production activities.

An opposing view is that all costs associated with an enterprise's manufacturing activities for a fiscal year should be included in the year's production costs to produce actual costs regardless of the relationship of the year's production to planned production activities. Some others argue that normalization of capacity costs is impracticable of implementation because of the high degree of subjective judgment involved.

Variable and Fixed Elements of Overhead. Variable overhead costs can be expected to fluctuate over a short range in more or less direct proportion to volume of production. The variable cost element in the overhead rate should therefore remain fairly constant throughout a fiscal year regardless of whether the volume actually experienced

has varied significantly from the level used in establishing the predetermined rate for the year.

Fixed costs do not vary with short-range changes in volume since they relate to the continuing costs of providing, maintaining, servicing, and administering the facilities and organization necessary to carry on manufacturing activities on a regular basis. They vary only in proportion to major changes in capacity to produce. A significant change in the year's volume from that planned in predetermined overhead rates will have an impact on the fixed cost elements in the rates.

If fixed costs relate to production capacities significantly greater than will be utilized at the production levels expected for the year, exclusion of costs of not producing requires that the fixed cost element of an overhead rate be at appropriate volume levels that would prevail under more normal operating conditions. Manufacturing overhead costs must be analyzed to segregate the fixed and variable costs relating to the facilities in question.

That does not mean that overhead rates must always be established separately for fixed and variable elements of costs. Appropriate rates can be established without segregation—for example, if capacities are utilized consistently at or near levels that represent normal expectancy in light of seasonal and cyclical variations. If production capacities are expanded, however, the segregation of variable and fixed elements usually becomes necessary because utilization may differ significantly from the normal level of production for which the added facilities are planned.

Selecting Appropriate Levels of Capacity Utilization for Overhead Rate Calculations. Accountants often try to establish simple designations of levels of capacity utilization to be considered in developing overhead rates. Most attempts employ words like capacity and practical. Unfortunately, the words have other connotations that tend to confuse their use in this technical accounting area. While *capacity* generally means ability to hold or accommodate something, it sometimes connotes available space; if used as an adjective, it implies attaining full utilization or maximum ability to contain or accommodate. *Practical* sometimes means being engaged or used in ordinary fashion in some action, but it is also used to denote full or maximum level. More descriptive terminology therefore appears necessary.

Responses of industrial executives to questions on capacity utilization levels clearly indicate that utilization levels are matters of oper-

ational forecasting and planning. Numerous variables must be considered in planning the utilization of existing facilities, such as the ability to expand or contract labor forces, availability of supervision, services required for multishift operations, physical effects of higher utilization of equipment, and production bottlenecks. Further, the variables must be considered in relation to make-or-buy decisions that are in turn related to possible expansions of the facilities to accommodate changing production requirements. Inherent in all the projecting, planning, and problem solving are special purpose cost studies.

Operations planned on the basis of one or two shifts can usually be expanded by overtime or by added partial shift operations, or they may be contracted as required by short-range changes in production volume. Ranges in volume are usually contemplated in planning the expected actual level of capacity utilization for a year. The level is frequently described as normal expectance and used as the logical level for overhead rate calculations if it consistently approximates management's planned utilization for longer periods—say, two to five years.

Adding new facilities to provide increased production capacity usually gives rise to step-level cost behavior patterns. For example, in the early years of an expansion program, actual levels of utilization of the new facilities are frequently lower than those planned after the new facilities are fully on stream. Until that point is reached, excess capacities exist. While the new facilities are used partially—below the planned full-stream utilization levels—excess capacity costs are not always clearly identifiable. Practice identifies them by setting the fixed element of the overhead rates at the level of plant capacity utilization planned as reasonably attainable at anticipated longer-range operations. Accordingly, unit product costs of the year's production (including those applying to year-end inventories) contain only the smaller fixed cost element that would prevail at the higher production levels. The unabsorbed fixed costs resulting from lower actual capacity utilization become period expenses, generally as unabsorbed overhead costs although sometimes identified as excess capacity costs.

A similar problem can arise if management decides to reduce plant utilization by phasing out a particular product line or manufacturing process and either to abandon the related production facilities or to convert them to other usage. The fixed overhead rate can be held at the earlier planned full-stream levels although actual production

is reduced to planned lower levels. Again the idle capacity costs become period expenses as unabsorbed overhead.

Conclusions on Idle Excess Capacity. Costs of idle manufacturing capacity should not be part of the overhead costs of the products manufactured in a period in which the excess capacity exists. No useful purpose is served by carrying a part of those costs forward in year-end inventories. Idle capacity costs should be considered to have expired as incurred and thus to be expenses of the periods in which they are incurred. The difficulties of identifying idle capacity costs for appropriate treatment are part of the general financial reporting problem of identifying costs and revenue with short periods of time. The solution involves the exercise of informed judgment and may be approximate at best.

A reasonable assumption is that profit-directed activities are planned formally or informally by managements. Accordingly, production of manufactured products takes place in relation to a previously planned set of conditions with respect to facilities, quantities, anticipated customer requirements, and selling prices. The plan adopted in a given company is based on judgments of management about a vast complex of related variables, some of which relate to the utilization of production facilities available or planned to be available. If we are to retain the matching principle, there is no feasible alternative to relying on the management accounting principles described here for inventory pricing purposes.

Absorption Costing vs. Direct Costing

The Conflict. The conventional concept of product cost is that the products manufactured during a period should bear their share of all costs associated directly or indirectly with the manufacturing activities of the period, except for costs of abnormalities and excess capacities. That concept has been described as full costing, full absorption costing, and absorption costing. A widely discussed opposing view is that the products manufactured should bear only their share of the variable costs of the period and that nonvariable costs should be expenses of the periods in which they are incurred. That concept has been termed variable costing or direct costing. It has frequently been described as part of the contribution approach to inventory valuation and income determination.

The accounting basis of inventories under these opposing views

differs conceptually in only one respect. Under absorption costing both variable and fixed elements of manufacturing costs are absorbed as product costs and become part of the cost basis of products in inventory. Under direct costing, only variable elements of manufacturing costs become product cost for inventory purposes; fixed elements of manufacturing cost become period expense in the same manner as administrative and general costs. In the simplest terms:

> The traditional absorption concept requires that fixed manufacturing overhead be part of inventory cost.
>
> The direct costing concept requires that fixed manufacturing overhead be omitted from inventory cost.

Stated another way, the controversy is essentially whether the fixed elements of the costs of providing manufacturing facilities should be matched against the revenue of

> the period in which the products manufactured with the facilities are sold or
>
> the period in which the costs to provide the facilities are incurred.

Much of the great volume of writings favoring direct costing deals with its advantages in internal reporting rather than with its underlying general financial reporting concepts, although some accountants advocate it for both purposes. This section will summarize rather than present detailed discussions of the voluminous arguments for and against direct costing.

Present Authoritative View. The discussion of Statement 3 in Chapter 4 of *ARB 43* states in part: "It should also be recognized that the exclusion of all overheads from inventory costs does not constitute an accepted accounting procedure" (Appendix A, page 160). The use of the term *directly or indirectly* appears to some to intend that all costs associated with production be included in inventory cost determination. The statement, "exclusion of all overheads," however, has been alleged by some proponents of direct costing as permitting some exclusion, such as fixed manufacturing costs. However, Maurice Moonitz, then the Director of Accounting Research of AICPA, stated in 1961 that nothing in the Accounting Research Bulletins issued by the committee on accounting procedure can or should be used to support the use of direct costing in published financial statements. He stated further that there is no doubt that the commit-

tee reacted unfavorably to the use of direct costing.[4]

The more recent *APB Statement 4* does not cover the point of absorption costing specifically but indicates in paragraphs 159 and 184 that costs of manufacturing products should include allocations of fixed costs, such as depreciation of plant.

Internal Revenue View. Direct costing proponents have asserted that federal tax law and regulations do not specifically require that fixed costs of manufacturing be included in inventory. Income determination for tax reporting purposes is an additional use of management accounting data that, in conforming with the requirements of law and regulation, may or may not conform with generally accepted accounting principles applicable to financial reporting. Consequently, pronouncements of the Internal Revenue Service on accounting matters are not viewed in this study as an authoritative source of support for accounting principles recommended for general financial reporting purposes.

Argument for Direct Costing. Proponents of direct costing allege two basic theoretical faults in absorption costing. One is its failure to place primary emphasis on cost behavior patterns rather than on functional cost relationships. Absorption costing thus fails to recognize that capacity costs do not vary with units produced in a particular period but expire with time. Therefore the costs should be accounted for on a time expiration basis. The second and deeper conceptual fault is that a fixed cost element in inventory cannot be justified as an asset.

Supporters of direct costing say that placing greater emphasis on cost behavior patterns makes it possible to present more useful information in income statements for both internal and external users. The variable costs—selling, administrative, and general, as well as manufacturing—can be identified readily with the products and activities that create the revenue of the period. Income determinations are therefore more understandable if the variable costs of products sold and the variable selling and administrative costs are first shown as deductions from the period's sales to arrive at the contribution margin available to cover the period's fixed costs. Net income is then determined by deducting from the contribution margin (1) discretionary fixed costs (sometimes called short-run) such as certain factory supervisory and administrative costs, general advertising and sales

[4] "Direct Costing and Public Reporting," *National Association of Accountants Bulletin* [now *Management Accounting*], October 1961, pp. 45-46.

promotion costs, and research and development costs, and (2) long-term fixed costs (sometimes called committed costs) such as depreciation, property taxes, insurance, and general administration costs. The fixed time costs are thus clearly set forth separately rather than buried in the conventional cost of products sold figures and functional grouping of period expenses. The contribution approach thus enables easy interpretation of the impact of changes in volume on net income.

Direct cost theorists depart from the traditional asset concept of manufactured products in inventory by adopting a concept of assets as costs that are beneficial to future operations or have service potential. They maintain that a fixed manufacturing overhead allocated to inventory under absorption costing does not meet this test; therefore, there is no justification in carrying it forward as an asset. They argue that the fixed costs incurred in a current period to provide manufacturing capacity have expired and cannot contribute to future revenue.

Absorption costing embodies the notion that fixed elements of manufacturing costs are incurred only for the purpose of furnishing manufacturing capacity and should therefore be allocated to the output of product regardless of whether the products are sold in the periods in which they are produced or held for sale in future periods. Supporters of absorption costing believe that the act of manufacturing merely converts a service capacity into a form—namely, product—from which the enterprise is able to derive revenue from sales and that the costs of furnishing the capacity should follow the same conversion process. Accordingly, direct costing's failure to allocate to product cost the fixed costs of the manufacturing capacities used in producing the products on hand at the end of the period results in failure to achieve appropriate matching of the costs of producing them with revenue to be derived from their sales.

Some direct costers have taken a somewhat modified position in recent years.[5] They recommend that short-run capacity costs be allocated with variable costs to unit product costs for inventory purposes. Only long-run capacity costs should be accounted for entirely as period expense. Professor Backer described the two types of cost in these words: "Costs identifiable with a specific year are defined as short run costs while costs identifiable only with longer periods are

[5] NAA publications abound with writings on direct costing, most of them favoring its use. The modified position is set forth in Morton Backer, *Financial Reporting for Security Investment and Credit Decisions* (New York: National Association of Accountants, 1970), pp. 103-109.

long run costs." [6] That distinction in capacity costs is related in turn to a new concept that, "for annual financial reporting, one year's output as a whole is the unit to be costed." [7] That is to be accomplished by considering that the incremental cost of the year's output (aggregate of variable and short-run capacity costs) should be "divided between cost of goods sold and inventory in the ratio of the portion of output sold to portion on hand." [8] Professor Backer's main arguments for expensing the long-run capacity costs are that they are not related to a specific year's production and that they can be allocated to annual production only by arbitrary methods.

Practical Aspects. The great volume of writings favoring direct costing deals with its practical aspects. The principal theme is that more realistic income determination results from matching fixed manufacturing costs against the revenues of the periods in which they are incurred. The procedure, coupled with the contribution approach to presenting income statements, is believed to provide management with the most useful information on operating results. Consequently, the same presentation should prove most useful to the external users. The direct costers' principal arguments against the practicalities of absorption costing revolve around its complexities, the difficulties of interpreting its results, and the criticism that fixed manufacturing costs can be allocated to products only through purely arbitrary methods.

Absorption costers admit to the usefulness of the contribution approach to portraying income but believe that the presentation of operating results can be used effectively for certain levels of management personnel without departing from the conventional concept of matching costs and revenue. They point out that many companies use direct costing for certain internal reporting purposes but make overall fixed cost adjustments to inventories so that external reporting conforms with generally accepted accounting principles and tax reporting requirements. The absorption costers argue that appropriate analytical cost procedures can provide logical allocations of fixed manufacturing costs that are no more arbitrary in nature than many of those used in allocating variable costs. They also point to the fact that many direct costers allocate both short-run and long-run fixed cost elements in analyzing their costs for pricing decisions and for segmental reporting.

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[6] Backer, *Financial Reporting*, page 105.
[7] *Ibid.*
[8] *Ibid.*

Conclusions on Absorption Costing and Direct Costing. My study disclosed that management accounting has long recognized that the most effective control of costs is achieved through reporting variable short-run costs in line with supervision responsible for their incurrence. Incremental or marginal costs of unit products have also been used for many years in pricing decisions involving additions to or deletions from product lines. Executives interviewed who were using some measure of direct costing internally indicated that for general pricing policy purposes fixed costs are allocated to the units in much the same manner as for absorption costing.

In other words, the allocation of fixed costs is considered to be relevant in determining the extent to which individual products or product lines should be contributing margin over variable costs to cover fixed manufacturing costs and commercial costs.

Management accounting involves assigning and allocating a continuing flow of manufacturing costs to periods, to activities, and to products. The manufacturing overhead costs of occupancy and use of production facilities and the overall costs incurred in servicing and administering the manufacturing function are incurred to manufacture products with which to generate income from sales. Accordingly, I consider it illogical to contend that the cost of the metal being formed in the machine and the labor hours being expended by the operator are part of product costs but not the costs incurred in managing the manufacturing activities and in providing and maintaining the machine and the lighted and heated facilities in which the operations take place. Industry representatives interviewed for this study were almost unanimous in their agreement with that conclusion.

There should be no doubt that the intent of present authoritative pronouncements on inventory costs is to require absorption costing. Failure to provide and maintain productive capacity results in failure to achieve proper matching of costs and revenue in accordance with the principles set forth in *ARB 43* and in *APB Statement 4.* The service potential concept of asset measurement proposed as theoretical support for direct costing must be rejected in this study because it conflicts with present generally accepted principles.

The cost of a manufacturing enterprise's product inventories should be calculated on a basis which does not eliminate that portion of the fixed manufacturing overhead costs applicable to the level of production capacity considered appropriate for the year's operations. The level of production capacity selected as the base for allocation of the fixed cost elements of overhead should produce overhead rates which eliminate costs attributable to idle excess capacities.

Summary of Recommendations

This chapter has dealt with the possibility of expanding authoritative identification of cost concepts and principles underlying determinations of unit costs of manufactured products. The search has focused heavily on practice since it is from that source that most of our accepted cost concepts and principles have been derived. Accounting practice, as it exists in the management accounting environment outlined in Chapter 4, will continue to be the major influence in establishing concepts and principles underlying the cost basis of inventories. The conclusions reached in this chapter are combined and summarized in the following statement.

UNIT PRODUCT COSTS TO DETERMINE THE ACCOUNTING BASIS OF INVENTORIES

Manufacturing costs. In computing the accounting basis of inventories for manufacturing enterprises, all operating costs logically associated with the manufacturing activities should be accumulated in functional classifications of accounting data to compile unit product costs for periodic determination of cost of products sold.

In general, only costs associated with manufacturing activities are includable in inventory. Manufacturing activities include those processes, functions, and operations involved in combining materials and services to produce products for sale to customers. They do not include the functions or services predominantly associated with the enterprise's general research and development activities or with its selling, general administrative, and financing functions.

In determining unit product costs to be used in arriving at the accounting basis of inventories, all elements of cost associated with the manufacturing activities of an enterprise are to be considered relevant to product costs except to the extent that they represent (1) costs of idle excess production capacities or (2) costs that are so abnormal as to preclude their ascribability to units of material and products on hand. Unascribable costs are considered to have expired and thus are expenses of the period.

Direct costs. To the extent that it is practicable to identify certain units of material as becoming integral parts of end products and to identify certain units of labor as being

applied to products in the various manufacturing operations required in their fabrication, the costs of material and labor should be accounted for as direct materials and direct labor and included as separate components of the unit product costs.

Normalizing cost factors. Recognizing production cost abnormalities as expenses is ordinarily achieved by normalizing the costs entering into the compilation of inventories. The idea of normal usage of direct materials and direct labor is related to standards of achievement reasonably attainable under ordinary operating conditions existing during the production period. The same concept of normality applies to overhead allocation.

Normal direct materials costs are those prevailing during the period for purchases of normal lot-size quantities from regular sources of supply. Normal direct labor costs include the hours required at reasonably attainable levels of production efficiency priced at the average hourly rates for the skills ordinarily required for the various operations. Normal overhead rates are those which allocate all manufacturing overhead costs incurred for the ordinary operating conditions existing during the period (except excess capacities). Overhead rates should include provisions for costs of normal amounts of waste and spoilage not otherwise included in direct materials and direct labor cost factors applied in unit product cost calculations.

Idle facility costs should be segregated and recorded as expenses of the period in which incurred.

Manufacturing overhead allocations. Manufacturing costs exclusive of direct costs represent indirect or overhead costs to be allocated to units of product. Allocations of overhead should reflect the extent to which the various products use or consume the enterprise's manufacturing resources and facilities. Underlying the validity of all allocation methods is the general concept of accumulating pools of costs having similar characteristics as to their functional origin or control, thereby enabling the selection of appropriately related statistical measurements through which to assign the overhead costs to products.

Manufacturing overhead rates used in calculation of unit

product costs for inventory valuation purposes are generally developed on a predetermined annual basis to reflect (1) reasonable averages of short-range or cyclical variations in those elements of costs which vary generally in relation to production volume (variable costs) and (2) appropriate relationships between those elements of costs which do not so vary (fixed costs) and the levels of utilization to which production capacities are committed for the year. Planned operations for the year should consider limited expansions or contractions necessary to accommodate short-term cyclical or seasonal demands. If operations are planned at levels of utilization which do not involve major expansions or contractions of available production capacity, they represent normal utilization levels for calculation of both the variable and fixed elements in the overhead rates. The normal expectancy levels so determined should be based on ordinarily scheduled work periods with appropriate allowances for employee rest periods, holidays, vacations, work stoppages for inventory-taking, and the like.

Idle excess capacity costs. If the expected level of capacity utilization falls significantly below normal expectations, the overhead rate should provide for absorption of fixed manufacturing overhead at a level of utilization considered to be reasonably attainable under the planned operating conditions for which the production capacities have been provided. Unabsorbed overhead therefore provides a means of identifying the amount of costs attributable to excess capacity which should be accounted for as expense of the period in which it is incurred.

The need for segregating costs of unused capacity occurs most frequently (1) if new facilities that have greater production capacities than immediately needed are added, (2) if operations are being phased out in anticipation of discontinuing certain product lines, or (3) if production facilities are in the process of being abandoned or converted to other uses. The fixed cost element of the rate in those circumstances should be based on the higher level of production activity that has been planned as reasonably attainable on a continuing full-stream basis or at the level that has been considered normal activity prior to the phase-out period.

6

Cost Flow Assumptions

Effect of Cost Flow Assumptions

Most of the discussion in Chapter 5 is directed to determining unit production costs within a fiscal period. Production costs may change significantly from one period to another. It is practicable in some types of operations to identify costs of a specific product from the time of manufacture to the time of sale. It is not considered practicable to do so in most types of manufacturing and merchandising operations. Many products are manufactured or acquired in lots of identical and interchangeable items at different times and at different costs. Therefore, pricing year-end or periodic inventories usually involves some assumptions as to which production period's costs or which merchandise purchase costs should be used in pricing products on hand at the inventory date. Cost flow assumptions thus become an integral part of the accounting basis of inventories.

Problems arise from the fact that the use of differing assumptions of cost flow may result in substantially different income determinations and asset valuations in circumstances which are substantively the same, particularly in choosing between the use of the first-in first-out (Fifo) cost flow assumption and the last-in first-out (Lifo).

This chapter discusses the significance of cost flow assumptions in the development of unit costs for inventory purposes and the potential diversities in results obtained under differing cost flow assumptions currently accepted in principle. Questions are raised as to whether it is logical to accept both the Fifo and Lifo cost flow assumptions in principle and whether it is practicable to develop criteria for the selection of the most acceptable cost flow in various circumstances. Suggestions and recommendations are made for potential solutions to the major problems involved.

Acceptance of the historical cost basis requires that the total historical cost incurred in an accounting period for merchandise or manufactured products be divided between those units sold during the period and those on hand at the end of the period. The amount of inventory costs to be carried over from one period to the next is commonly obtained by determining the appropriate cost basis of quantities physically inventoried at or near the end of the period. That requires identifying certain merchandise and manufacturing costs with physical quantities of merchandise acquired or products manufactured, even though it is considered impracticable to maintain specific identification of merchandise and products flowing through the operation.

Practical solutions to the problems of identifying costs with specific physical quantities on hand have evolved through assumptions of cost flow such as Fifo and Lifo. Some practitioners and theorists believe that a more meaningful matching of costs and revenue is achieved by applying an appropriate cost flow assumption to certain types of operations than could be obtained by attempting to identify costs based on the actual physical flow of merchandise and products.

Those people view cost flow assumptions as basic income determination concepts rather than mere methods. Others view the potential diversity of results under different cost flow assumptions as evidence of a need for broad principles to guide cost flow implementation and for criteria to indicate appropriateness of different assumptions. Disclosure of the cost flow assumptions employed is considered essential to an understanding of an enterprise's income determination and asset valuation.

Authoritative Recognition. The need for assuming a cost flow in calculating the accounting basis of unit product costs for year-end inventory purposes has long been recognized as a basic principle, stated in *ARB 43*, Chapter 4, Statement 4, as follows:

> Cost for inventory purposes may be determined under any one of several assumptions as to the flow of cost factors (such as first-in first-out, average, and last-in first-out); the major objective in selecting a method should be to choose the one which, under the circumstances, most clearly reflects periodic income.

APB Statement 4 also mentions cost flow in connection with the cause and effect principle of associating expenses with related revenue (P-3, *Associating cause and effect*, paragraphs 157 and 158).

Types of Cost Flow Assumptions. Fifo and Lifo are widely recognized as basic cost flow assumptions. Some writers and certain authoritative pronouncements (as above) use terms such as average and standard costs as appropriate descriptions of the accounting basis of inventories. The various commonly used terms are described to provide a basis for discussion of the problems.

Specific Identification of Costs. The term *cost* used without further explanation or qualification in describing the accounting basis of inventories usually means specific identification of unit costs or a basis sometimes referred to as actual cost. The term *cost* is appropriate for describing inventories of certain merchandising enterprises such as distributors of heavy equipment, automobile dealers, and dealers in art objects, antiques, and expensive jewelry. Specific identification of costs is also considered preferable in custom manufacturing of heavy equipment, cost-recovery-type contracting, and major construction contracting. The distinguishing characteristics of inventories for which specific identification is practicable are that they are composed of large, relatively expensive items not having interchangeability and that they are purchased or produced as individual units or in small quantities.

Fifo. The first-in first-out assumption of cost flow is recognized intuitively as being generally consistent with the physical flow of material and production processes in most manufacturing and extractive operations and with the physical flow of products and goods in most merchandising operations. Fifo is compatible with the concepts of associating direct manufacturing costs with products through physical identification and with the allocation of indirect costs of a period to the products physically identified as manufactured during the period.

Lifo. The last-in first-out assumption of cost flow is seldom justified as following the physical flow of merchandise. Year-end inventory quantities that equal those on hand at the beginning of the year are priced at the beginning-of-year cost basis. Year-end quantities that exceed those at the beginning of the year are priced at a basis reflecting current-year cost incurrence. The effect on income is to match latest incurred production or merchandise costs against the current year's sales revenue.

Lifo originated from the criticism that Fifo did not properly reflect income if a quantity of inventory was clearly identifiable as a minimum

necessary to a continuous process type of operation. It was believed that in those situations periodic income was distorted by applying current period prices, fluctuating from year to year, to the base stock quantities. Early use of Lifo was confined to situations in which it could be applied to specific quantities.

Widening the use of Lifo beyond the situations in which it could be applied on a unit-of-product basis led to complex methods of implementation. The so-called dollar-value method of calculating the Lifo basis of inventory is an illustration. Current-year costs are translated under dollar-value Lifo into prior-year cost levels by the application of statistical indices to obtain comparisons between years at constant price levels. The amounts so determined serve to measure changes in quantities between beginning and ending inventories from year to year.

Average. Practically all unit product cost determinations in manufacturing operations involve some degree of averaging, batching, or pooling of input costs during some specific period as part of the allocation of costs to the period's production. Process cost methods, as noted at page 52, use broad averaging as the only practical means of determining unit costs of products manufactured in continuous process types of operations. Food processors may average acquisition costs during a crop season for calculating unit costs of canned vegetables and fruits. Similar averaging is sometimes applied to costs of logs, pulpwood, tobaccos, and other materials procured seasonally or regionally. Those types of average costs frequently underlie the Lifo and Fifo cost flow assumptions used in calculating the cost basis of finished products. The unit cost basis of finished products or merchandise is sometimes calculated on averages of input costs for specific periods. The retail inventory method, described at page 121, employs averaging in calculating the departmental markup percentages used to reduce the aggregate current retail value of inventoried items to an approximate cost basis.

The question is whether using the term *average* as a definitive description of the accounting basis of an inventory distinguishes the basis sufficiently from a Fifo or Lifo cost flow assumption. Do averages reflect current cost? If not, how do they compare with current costs? Over what period are they calculated?

Standard Costs. The term *standard costs* is sometimes used in balance sheets to describe the accounting basis of inventories. Usage

probably grew out of footnote 3 of *ARB 43*, Chapter 4, which reads:

> Standard costs are acceptable if adjusted at reasonable intervals to reflect current conditions so that at the balance-sheet date standard costs reasonably approximate costs computed under one of the recognized bases. In such cases descriptive language should be used which will express this relationship, as, for instance, "approximate costs determined on the first-in first-out basis," or, if it is *desired* to mention standard costs, "at standard costs, approximating average costs." (Emphasis added)

In light of present-day practice, the statement is interesting in several respects. It shows the tendency to accept in principle the use of unit product cost standards, a cost concept that was developing rapidly in the early 1940s when the substance of Chapter 4 of *ARB 43* was in process of formulation. The statement recognizes that the use of the term standard costs without further explanation is not a meaningful disclosure of the cost basis of inventories. Notwithstanding, the term is still used by some without further explanation.

Unit product cost standards are described in Chapter 5 (page 53) as predetermined or planned specification costs. They are used extensively in manufacturing operations to provide cost controls and to enable continuing audit of the validity of cost factors used in unit product cost determinations for various cost objectives. In many types of manufacturing operations, their use is recognized as the most practical method of recording cost flow during interim accounting periods and for obtaining interim cost of products sold. The commonly accepted use of the standard cost procedure requires that the unit product cost standards be established on a basis that reflects not only reasonably attainable performance under normal operating conditions but also year-end current cost factors needed for inventory costs. Year-end unit product cost standards have become widely accepted in practice as an appropriate basis for determining costs of inventory. Unit product cost standards therefore represent a *method* of determining product costs which may be used with either the Fifo or the Lifo cost flow assumption or in part with specific cost identification.

Retail Inventory Method. The large volumes of purchase and sales transactions in department stores make specific identification of merchandise costs impracticable. The retail inventory method has been accepted for many years as a practical method of determining departmental inventory costs for income determination purposes. Operation of the method is described in Chapter 8. It is noted here to distinguish

it as a *method* of determining costs that may be used with either a Fifo or a Lifo cost flow assumption rather than a basic cost flow assumption itself. Its use is ordinarily disclosed in describing the inventory basis with a statement such as "at lower of cost (either Fifo or Lifo) or market as determined under the retail inventory method."

Comparability and Different Cost Flow Assumptions

Specific Identification of Costs. Valid comparisons of inventory and reported net income between financial statements of two or more enterprises in similar lines of business are usually possible if all use specific cost identification as the accounting basis of inventories. For example, income statements of two dealers who both use specific identification for similar types of art objects could usually be compared validly. The inventory amounts normally present valid comparisons between the cost basis of the respective quantities of merchandise on hand. The same is true of merchandisers of commercial equipment, such as heavy machine tools, farm equipment, and automotive equipment, who commonly use specific identification in accounting for costs of inventories. On the other hand, valid comparisons might not be possible if one or more of the companies averaged costs for broad categories of merchandise even though specific identification was practicable in the circumstances.

Fifo. Year-end inventory valuations of manufacturing enterprises using Fifo generally reflect:

> **Raw materials and purchased components.** The quantities on hand priced at normal delivered purchase costs in effect during the most recent period in which quantities equal to those in the inventory were acquired.
>
> **Work in process and finished products.** The quantities on hand priced at the unit product costs applicable to the most recent period in which quantities equal to those in the inventory were produced.

The year-end inventory valuations of merchandising enterprises using Fifo generally reflect purchase costs of merchandise during the most recent periods in which quantities equal to those on hand were acquired. Thus, Fifo cost flow usually reflects an enterprise's most recent cost experience as the basis of the inventory amounts carried forward

in its year-end balance sheet and reflects all other production and merchandise cost incurred for the year as expenses deducted from the year's sales revenue.

Reasonably valid comparisons as to the accounting basis of inventories and the matching of costs and revenue are usually provided in the financial reporting of enterprises in similar lines of business if each uses the Fifo cost flow assumption. Inventory amounts usually provide fairly accurate comparisons after consideration of factors such as product mix and differentials in acquisition costs. Comparisons of cost of products sold in relation to revenue as shown in the income statements of companies using Fifo usually reflect differences in overall cost/price relationships arising from normal operating factors such as relative acquisition costs of materials and labor, relative production cost experience, and relative inventory turnovers. Therefore, there probably is reasonable assurance that comparisons between companies are not subject to distortion because of hidden factors inherent in the cost flow assumptions per se.

Lifo. The aggregate Lifo basis of inventories compiled under either the unit product application or the dollar-value method usually comprises a series of layers at the various cost levels at which quantities were added to the inventory annually, starting with the year in which the method was adopted. The reductions in basic Lifo quantities are removed from the composite basis in reverse order of additions. Accordingly, quantity fluctuations from year to year may cause significant fluctuations in the overall relationships between the Lifo basis of cost and the current cost.

Applications of the Lifo cost flow assumption by manufacturers vary somewhat depending on whether the Lifo cost is applied on a unit product basis or on a dollar-value index basis. In either case, however, it is usually necessary to compile the year's current cost basis of inventories in accordance with the same concepts and principles applicable to the Fifo basis. The current-year unit product costs are used if Lifo is applied on a unit-of-product basis to price year-end inventory quantities which are in excess of those at the beginning of the year. The only significant difference of those unit product costs from unit product costs used in the Fifo cost basis is that the materials content and direct labor content are sometimes calculated for Lifo on the basis of the earliest costs (or yearly average) rather than the latest applicable costs in the year. The manufacturing overhead costs are usually considered on an annual rate basis.

If Lifo cost flow is applied on a dollar-value index basis in manufacturing operations, the quantities on hand at the year end are usually priced on the basis of both the current-year Lifo cost and the base-year Lifo cost of units of product or the basic components. The amounts so derived serve two purposes: (1) to determine the extent to which the quantities on hand at the year end are more or less than those on hand at the beginning of the year and (2) to calculate index figures for the current-year level of costs, which in turn are used to arrive at the current-year basis of Lifo cost applicable to an increase in year-end quantities over those on hand at the beginning of the year. (Chapter 8 describes the index basis used in the retail inventory method.)

Comparability Between Companies Using Lifo. As applied in practice, Lifo dissociates the pricing of inventories from the concept of physically identifying products with the observable periodic flow of incurred costs. That creates several factors that may distort or destroy the validity of comparisons between financial statements of different companies using Lifo. Three principal factors can produce diverse results in the accounting basis of inventories between enterprises using Lifo:

1. The annual calculation of the Lifo cost basis may relate a substantial portion of the current year-end inventory quantities to costs in the year in which the Lifo method was originally adopted. However, if there have been significant quantity fluctuations since the base year, portions of the current year-end quantities may be priced at the *costs in any of the various years since the adoption of the Lifo method* up to and including the current year.

2. Variations in the method of applying the Lifo basis to year-end inventories may cause differing results that may significantly distort comparisons between companies. For example, differences may result from the use of the unit product basis as compared with the dollar-value basis of determining quantities between years, or the dollar-value basis itself may cause differences from the varying numbers of pools or product classifications used in Lifo calculations.

3. Variations in Lifo assumptions may produce substantially different results. The Lifo basis may recognize or it may disregard the effect of technological changes affecting the amount of materials, labor hours, machine hours, etc., used in calculating the various layers entering into each year's inventory basis for a manufacturing enterprise. For example, one fertilizer manufacturer may apply Lifo on a basis of tonnage of specific types of raw materials and finished products. A comparable organization may apply Lifo to units of basic chemical ingredients and conversion costs, arriving at different results, even though both organizations adopted Lifo in the same year.

Potential variations and combinations in applications of Lifo present an almost incomprehensible array of differing accounting bases that might result from applying the Lifo concept to similar inventories.

Lifo–Fifo Comparison. While the foregoing potential lack of comparability is likely to occur between similar companies using Lifo, valid comparisons may be almost impossible between similar companies if some use Lifo and others use Fifo. That is particularly true of comparisons between the balance sheet figures for inventories; the Lifo basis may be completely unrealistic in relation to the current-period costs used in pricing inventory under the Fifo basis. The lack of comparability in the income statement from the use of the two dissimilar cost flow bases may range from a high to an almost negligible degree. Matters such as the rate of turnover of inventories, the rate of changes in inventory prices, the length of time since Lifo was adopted, and the significance of variations in inventory quantities are all important.

Perhaps the most disconcerting feature of Lifo and Lifo–Fifo comparability is uncertainty. Many financial executives interviewed were asked to rate the degree of comparability they believed might exist between the financial statements of all the companies in their particular industries if all used Lifo. Similarly, they were asked to rate the degree of comparability assuming all companies used Fifo and all other pertinent factors were reasonably comparable between the companies. Almost all believed a reasonably high degree of validity of comparisons would exist between the companies on a Fifo basis as to both balance sheets and income statements. Most expressed belief either in a low degree of validity of comparisons between companies

on Lifo or in the impracticability of determining the degree of comparability without substantially greater disclosure of underlying accounting information than normally exists in today's general financial reporting. Those are opinions of financial executives about comparisons of companies in their own industries.

Conclusions—Cost Flow Assumptions

Need for Disclosure of Basis. The foregoing descriptions of cost flow assumptions and the problems of comparability arising from their use present ample evidence that the disclosure of cost flow assumptions continues to be essential to an understanding of an enterprise's income determination and asset valuations. Further, a need for authoritative guides for disclosures seems evident.

Specific Cost Flow as Compared with Assumed. There appears to be little theoretical argument against the use of specific identification of cost with units of product if that method of determining inventory costs is practicable. Further, there appears to be little practical argument against using specific identification for inventories composed of relatively expensive units that are purchased or produced individually and are not interchangeable. Assumption of a cost flow could produce an unrealistic cost basis for inventories and fail to reflect an appropriate matching of costs and revenue. On the other hand, if products are indistinguishable and interchangeable, the use of identified costs from various lots may be impossible or at least impracticable.

Is it practical then to develop criteria for the circumstances in which specific identification or a given cost flow assumption should or should not be used? First let us consider whether it is practical to define the characteristics of products and merchandise that would always require specific identification of cost to the exclusion of any other cost determination basis or, on the contrary, the characteristics of those for which it would never be acceptable to use specific identification. The question is basically that raised by R. K. Mautz:

> Is it reasonable to contend that any authoritative body can, in isolation from the facts of unknown cases, determine that certain accounting treatments should never under any conditions be applied?[1]

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[1] *Effect of Circumstances on the Application of Accounting Principles* (New York: Financial Executives Research Foundation, 1972), p. 30.

My answer to the question is negative. It seems desirable, however, to provide some authoritative guides for the use of the specific identification method of pricing inventories because it is recognized as fundamentally sound and preferable in some circumstances but not preferable in others. Effective guides might result from describing the characteristics of products and merchandise for which specific identification of unit cost is most acceptable and citing some illustrations. That discussion is presented later in this study as part of the recommendations for further authoritative pronouncements on the general subject of cost flow assumptions.

Do the Terms *Average* and *Standard Costs* Adequately Describe a Cost Basis of Inventories? Some indication of the time of purchase or production appears to be a fundamental element in disclosure of the cost basis of inventories. Knowledge of whether or not the cost basis is of current vintage adds to a user's understanding as to which portion of a period's costs are being matched against its revenue and which portions are being carried forward. Further, current inventory costs can generally be assumed to have relevant cost/price relationships and imply profit potentials similar to recent profit experience. Such reasoning makes the extent to which inventory costs may or may not be of current vintage an important element of disclosure.

The element of time is lacking if the term *average* is used without further description for identifying the cost basis of inventories. Earlier discussion pointed out that various degrees of averaging enter into cost determinations under both Fifo and Lifo cost flow assumptions. Accordingly, I conclude that the term *average* does not provide an adequate disclosure of the cost basis of inventories as distinguished from Fifo and Lifo. Prohibiting use of the term in that manner should not preclude the use of averaging in cost determinations if it is appropriate. If averaging is a sufficiently important factor in cost determination to warrant disclosure, I believe a description of the type of averaging employed should be required.

Our research disclosed that the concept of standard costs—or specification costs—is commonly used in various ways in determining costs of manufactured products and their components. We found that unit product cost standards, adjusted periodically to reflect current cost experience, frequently form the basis of inventory cost under both Fifo and Lifo cost flow assumptions. Accordingly, I conclude that the use of the term *standard costs* by itself is not

adequate to identify the cost flow assumptions in the basis of inventories.

Lifo–Fifo Controversy

The Questions. Several features of Lifo have generated controversial issues since its introduction in the 1930s. A major source of controversy developed from early efforts to have Lifo accepted for federal income tax purposes and from later efforts to remove limitations placed by taxing authorities on its use. Theoretical controversies developed over Lifo's artificial assumptions which departed from accepted concepts of associating costs with the observable physical flow of products and merchandise and the effects of the artificial assumptions on some of the fundamental objectives of financial accounting. Implementation difficulties inherent in Lifo have caused arguments over problems of applying Lifo through the dollar-value method to complex inventory situations in which unit product applications are impracticable. The comparability problems, summarized earlier, have caused continuing controversy over the use of Lifo.

The thirty years beginning in 1930 brought forth an amazing volume of writings on subjects related to the Lifo–Fifo controversy. My review of the writings on the nontax aspects of the subject reveals that they were (1) numerous, (2) at times controversial, (3) often inconsistently argumentative, and (4) difficult to distill as clear-cut conclusions.

Origin and History of Lifo. Perhaps the best way to understand how we have arrived at our present posture of accepting both Lifo and Fifo in principle is to summarize the significant milestones in the chronological development of Lifo.

Substitute for the base stock method. The Lifo concept was adopted as a replacement of the base stock method of determining the accounting basis of inventories. Base stock was used by some companies (mostly in England) in the latter part of the nineteenth century and had limited use in the United States during the early 1900s. Under that method, a quantity of inventory considered by management to represent the minimum base for effective operation was treated for accounting purposes in much the same manner as a fixed asset. The base quantity was carried forward from year to year at its original cost or at an arbitrary nominal cost. Deficiencies in base quantities at the end of a year were usually considered tem-

porary, and reserves were provided for anticipated excess costs of replacement over the amount at which the products would have been included had the base quantities been maintained. Thus the earnings of a period in which a temporary reduction occurred were not affected by either the temporary liquidation or the replacement of the base stock quantities.

Inventory quantities in excess of the base stock were generally carried on the Fifo basis of cost flow. The principal users of the base stock method in this country were producers and refiners of metals and petroleum products. The method gained attractiveness with the advent of the income tax law in 1913. Its use avoided fluctuations of income (and tax effect thereof) that would have resulted from pricing the base quantities at fluctuating cost levels from year to year. Income tax authorities disallowed the use of the base stock method and in 1930 the Supreme Court of the United States upheld that decision in the Kansas City Structural Steel Company case.

American Smelting and Refining Company, National Lead Company, and several large petroleum companies were identified as early users of Lifo as an adaptation of the base stock method.[2] The American Petroleum Institute recommended the adoption of Lifo for the oil industry in 1934. The recommendation was approved by a special committee of the American Institute of [Certified Public] Accountants in 1936.

Initial limited acceptance for taxes. Pressure to accept Lifo for tax purposes increased steadily after 1930, and in 1938 Congress amended the tax law to recognize Lifo as an acceptable method for processors of basic metals and tanners of hides. Others seeking to use the method said the law was discriminatory against all other enterprises whose determination of taxable income required accounting for inventories. It was argued that all these taxpayers have, to varying degrees, certain basic inventory quantity features similar to those of companies then granted the Lifo tax advantages. Congress accepted the argument and amended the tax law further in 1939 to permit extension of the Lifo privilege to all industries. However, the new law provided that (1) a taxpayer using Lifo must also use it for general financial reporting purposes, and (2) the Lifo basis could not be reduced for tax purposes through application of the conventional lower of cost or market rule.

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[2] Maurice E. Peloubet, "Last-in, First-out Once More," *The Journal of Accountancy,* June 1940, p. 447.

Since Lifo originated in industries whose inventory levels could usually be measured in quantities of common units of product, early tax regulations dealt with quantities of items, implying that the use of Lifo necessitated specifically identifying quantities of goods of uniform physical likeness or composition. The narrow interpretation seemingly made Lifo's tax benefits unavailable to taxpayers whose basic inventories were composed of products subject to change in style, design, production methods, substitutions of materials, and the like. World War II was under way in Europe and many managements could see great potential tax savings in the use of Lifo to keep expected price inflation out of their inventory valuations for taxes but could find no practical application of the method under the restrictive regulations then in effect.

Dollar-value method. The dollar-value Lifo method was proposed in that atmosphere during 1940 and 1941. In writing on this subject, H. T. McAnly, one of the earliest and most ardent proponents of the method, said:

> If the principle is considered sound, practical means of applying it must eventually be recognized so as to permit its use in valuing all cost elements in the total inventory of an enterprise, even though its operations may embrace the *production, jobbing, wholesaling or retailing of a wide variety of items.*
>
> Whether or not the same quantities of specific items or the same items are in the inventory at the close of the year as were on hand at the beginning of the year, the last-in, first-out principle should be applicable in determining an aggregate valuation of an investment in inventory of related products. Changes in product design eventually eliminate many articles which in turn are replaced by other products. The individual item quantity balances in a group of related products may vary widely in comparing the beginning quantity of each with the ending quantity of each. Thus, if the last-in, first-out principle is applied to individual items rather than to the determination of the aggregate valuation of the group of related products . . . the objective of the principle will not be accomplished and the income will not be clearly or correctly reflected.[3]

Notwithstanding the adverse position of taxing authorities on dollar-value Lifo, a small number of industrial companies and depart-

[3] "A Practical Method of Keeping Inflation Out of Inventory Valuations" (1941), in *Dollar Value Lifo, Cost Accounting Concepts, Management Services* (Ernst & Ernst, 1964), pp. 34-35.

ment stores adopted Lifo on the dollar-value method in 1941. The ensuing tax controversies culminated with the Hutzler case in 1947, in which the Tax Court ruled in favor of a Baltimore department store that had adopted dollar-value Lifo in 1941. Taxing authorities recognized the method as permissible for department stores in 1948 and extended the privilege to other taxpayers in 1949. Thus, ten years after Congress gave all taxpayers the right to use Lifo, the Internal Revenue Service endorsed its widespread application.

A new wave of Lifo adoptions. Between 1938 and 1949 general price levels had more than doubled, but many companies had failed to adopt Lifo because of adverse positions taken by taxing authorities. Numerous companies considered adopting Lifo after the Hutzler case. The tax law prohibition against reducing inventories if market prices dropped below those of the Lifo base discouraged adoption of Lifo by some companies; disadvantageous tax positions might result if price levels were to fall below those of the year in which they adopted Lifo. Notwithstanding, many companies did switch to Lifo as a result of continuing rises in price levels and the reinstatement of excess profits taxes during the Korean conflict.

Bills were introduced in Congress in 1952 in an unsuccessful attempt to remove the two major obstacles in tax law to the adoption of Lifo—the prohibition against reducing the Lifo inventory basis to recognize lower market prices and the mandatory provision regarding the use of Lifo for general financial reporting purposes. Finally, the Internal Revenue Service regulations on the dollar-value method of Lifo were issued in 1961, twenty-two years after Congress extended the Lifo election to all taxpayers.

Historical imprints on the Lifo controversy. The historical summary provides insight into how the Lifo–Fifo controversy developed and reached its present state. Lifo originated out of a tax controversy over the use of the base stock method. The tempo of arguments over Lifo accounting issues closely followed those of the tax arguments. As noted in the next section, arguments over theoretical Lifo issues have diminished since the early 1950s even though many issues remain unresolved. Some early opponents of Lifo gradually changed views and others became silent, probably because they did not want to argue against a basis that had been proved to have significant tax advantages for many enterprises. History indicates that tax law and regulations had a great deal to do with our present acceptance of Lifo in accounting principles, notwithstanding its conflicts with the Fifo concept.

Underlying Rationale. Distillation of clear-cut pros and cons in the Lifo–Fifo controversy is difficult for several reasons. One is the sheer volume of writings, many of which emphasize the tax aspects to the point of obscuring the underlying accounting concepts. Many writings deal principally with methods rather than theory—for example, the dollar-value versus the unit product method of applying Lifo. It appears, too, that strong theoretical support of Fifo did not become particularly necessary or meaningful until Lifo became accepted for tax purposes. Also, the rationale of the base stock method seems to have faded out of the picture even though Lifo is generally recognized as its practical substitute with much the same theory.

Fifo rationale. The basic rationale underlying Fifo is the logic of the pattern of the physical flow of goods. For most companies, the first items in are logically the first items sold or used. Problems of deterioration and obsolescence cause management to make a conscious effort to insure that pattern of movement. Further, the units manufactured or purchased in the later part of the year obviously cannot be the physical units sold during the first part of the year. Fifo thus becomes the most logical assumed flow of goods if specific identification is not practicable. The rationale of product or merchandise cost is fundamentally that of cause and effect. The production of certain products causes certain costs to be incurred. Cost incurrence can be observed as relating to the products manufactured during certain periods. The acquisition of merchandise causes the incurrence of certain purchase and delivery costs. Cause and effect relationships are sometimes described as a logical "attaching" of costs to products. The concept of incurred costs attaching to specific products and merchandise, coupled with the most logical assumed flow of physical units, is the basic rationale underlying the Fifo assumption.

Lifo rationale. Lifo does not have as clear-cut a rationale as does Fifo. Complex theories have been set forth to support it but the fundamental rationale appearing most frequently revolves around these four points:

1. A minimum quantity of inventory can be identified by many enterprises as necessary for a going concern operation and therefore represents an involuntary fixed commitment analogous to a fixed asset.
2. Increases or decreases in the cost basis of the fixed minimum quantities that would result from pricing them at

current purchase prices would represent unrealized profits or losses that should not be reflected in net income of the various periods if an appropriate matching of costs and revenue is to be achieved.

3. Eliminating unrealized profits and losses under the base stock inventory method involves assignment of arbitrary cost prices to arbitrary quantities of inventory, thereby failing to meet desired degrees of objective reality and verifiability in accounting for inventories.

4. Lifo achieves the elimination of unrealized profits and losses objectively by establishing base stock quantities at each year end as the quantities equal to those on hand at the beginning of the year and pricing the base quantities at the cost that pertained at the beginning of the year.

It thus becomes apparent that Lifo is a compromise method of achieving a matching of costs and revenue recommended under base stock theory, without a theory of its own. It is not a method of determining cost of products as such. It is, instead, a method of matching costs and revenue under an artificial assumption that dissociates the flow of cost incurrence from the physical flow of product.

Some have advanced the theory that Lifo substitutes a fictional relationship or agency between the fabricator and customer similar to that existing in hedging operations. Many have theorized that the matching of most recent costs against current revenue is better than the Fifo method because it more closely correlates sales with the cost basis at which the enterprise will have to replace the items sold and that Lifo thus brings reportable net income closer to cash income available for distribution. Some Lifo proponents have argued that its cost flow assumptions remove from income significant portions of general price-level changes, but recently that argument seems to have been abandoned. In the final analysis, most of the arguments for Lifo relate to the base stock theory of eliminating unrealized profits from certain fixed quantities of inventory necessary to maintain operations.

Base stock quantity theory. Theorists arguing against the base stock quantity theory say that all units of inventory are acquired and held for sale; each purchase is an independent decision as to time, type, and quantity, and each inventory turnover restores liquidity and sets

the stage for a new set of inventory decisions. Lifo proponents generally support the base stock quantity theory in about the same terms as the arguments set forth in the tax hearings on Lifo in 1938 and 1939. Some of the most forceful base stock arguments were set forth by Lifo proponents who later argued against extending Lifo through the dollar-value method of application.[4] Accordingly, support of base stock quantities was most frequent in terms of the refining of nonferrous metals and petroleum products. A typical illustration was the petroleum refinery—a continuous process in which a fixed minimum of product must be present in pipelines and equipment at all times to avoid shutdown of the entire process. The argument is that the fixed minimum quantity is not available for sale by a going concern—it is as fixed in character as the lines and equipment.

Unrealized profit theory. Lifo proponents have alleged that Fifo cost flow produces the effect of recognizing unrealized income. For example, the replacement of a unit of product or goods costing $1.00 by one costing $1.50 that remains in inventory has the effect of increasing income by $.50, even though the amount of income has not been realized. The argument has frequently gone unanswered since the Fifo proponent does not claim that his method purports to have realized the income; he has merely assigned an appropriate amount of the period's cost to the unit on hand at the year end, and that cost will in turn be matched against income when the unit is sold in a future period. Other Lifo proponents have attempted to support their positions with the argument that the realization of income exists only to the extent that the sales price of an article exceeds its replacement cost (rather than its specific or assumed Fifo cost) and that capital is impaired until the article is replaced.

Contrary arguments were presented by Maurice Moonitz, who summarized the views of many critics of Lifo theory.[5] He stated that Lifo presumes a type of business and economic system that does not exist. Further, even if one were to subscribe to the base stock, unrealized profit theory, there is no sound reason to attempt to remedy inaccuracies in the income statement by creating inaccuracies of unknown magnitude in the balance sheet. The Moonitz article was followed in the same issue of *The Journal of Accountancy* by a re-

[4] Peloubet, "Last-in, First-out Once More," pp. 446-450.

[5] "The Case Against Lifo as an Inventory-Pricing Formula," *The Journal of Accountancy,* June 1953, pp. 682-690.

sponse from H. T. McAnly summarizing the case for Lifo.[6] He stated that Lifo in effect legalizes the base stock theory disallowed by taxing authorities in the 1930s; Lifo not only eliminates the unrealized profits but also charges the added costs of carrying inventory to the year in which price increases occur.

McAnly also answered the balance sheet criticism by recommending that a figure representing the excess of the lower of incurred costs or market value of inventory be added to the Lifo balance sheet amount and that the same amount be shown in the equity section of the balance sheet as a "reserve to prevent impairment of capital covering inventory cost increase." Moonitz concluded that Lifo is a device for deferring tax and not for measuring income because it suppresses realized market gains and losses and assigns nonexistent stability to earnings and inventories.

Criteria for the Use of Lifo?

The AICPA's first general pronouncement on inventories was *ARB 29*, issued in 1947. It contained these words following its observation that several assumptions of cost flow may be made in arriving at the accounting basis of inventories:

> These methods recognize the variations which exist in the relationships of costs to sales prices under different economic conditions. Thus, where sales prices are promptly influenced by changes in reproductive costs, an assumption of the "last-in first-out" flow of cost factors may be the more appropriate. Where no such cost-price relationship exists, the "first-in first-out" or an "average" method may be more properly utilized.

That attempt at describing the circumstances under which various cost flows might be appropriate was eliminated in the codification of the statement in *ARB 43* in 1953.

The following characteristics of inventories were among those considered as necessary to make Lifo appropriate according to testimony presented in 1938 before the U.S. Senate Finance Committee hearing on the tax status of Lifo:

1. Inventories must be large in relation to other assets.
2. Inventories must consist of a few basic materials that form a substantial part of the cost of products sold.

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[6] "The Case for Lifo: It Realistically States Income and Is Applicable to Any Industry," *The Journal of Accountancy*, June 1953, pp. 691-700.

3. The spread between raw material costs and selling prices must be relatively constant.
4. Inventory turnovers must be slow because of the length of the processing cycle.
5. Raw material to fill specific orders must customarily be purchased.

The arguments against extending Lifo beyond its unit product applications contained numerous descriptions of the types of inventories for which Lifo was, or was not, considered appropriate. Mr. Peloubet[7] contended (1) that it was obvious that the Lifo method was not suited for use in a trade or industry in which one type of material is completely disposed of and not replaced and another type of material is substituted and (2) that it was generally agreed at the time that Lifo was not suited to merchandising businesses. The 1940 *N.A.A. Yearbook* contained a statement to the effect that Lifo is applicable only if a company maintains an investment in goods of identical character. A committee of the AICPA, working with the merchandising industry in 1942, reported no knowledge to that time of cases of applying the Lifo method except those in which specific identification of quantities was possible.[8]

Most arguments and attempts to set forth criteria for the use of Lifo were dissipated by the Hutzler tax case in 1947 and the subsequent increased adoption of the dollar-value method of applying Lifo to complex inventory situations, including those of department stores. In a letter, Maurice Peloubet reversed his previous position of applying Lifo only on the unit of product basis and praised Mr. McAnly for his consistent and successful efforts to make Lifo's use available to all through the dollar-value method of application.[9]

Conclusions on Lifo–Fifo Theory and Criteria for Use of Cost Flow Assumptions

Fifo. Based on all the evidence available, I conclude that Fifo is the most logical assumed flow of goods if specific identification is

[7] Peloubet, "Last-in, First-out Once More," p. 447.

[8] "The Last-in, First-out Inventory Basis," Report by American Institute of Accountants Committee on Cooperation with Controllers' Congress of the National Retail Dry Goods Association, *The Journal of Accountancy,* February 1942, p. 148.

[9] *The Journal of Accountancy,* April 1951, p. 527.

not practicable. It can be observed in real-life fashion in the production and merchandising processes. It is compatible with the fundamental cause and effect relationships underlying product cost determinations. Interviews disclosed that Fifo cost flow is fundamental to management planning and control of cost and cost/price relationships, even by enterprises using Lifo for tax and external financial reporting purposes. Within the historical cost framework, Fifo cost flow reflects a matching of costs and revenue in the manner that production and merchandising operations exist in the business and economic system in which we live.

Lifo. Our study disclosed no valid arguments against the notion that the Lifo cost flow concept is an artificial assumption which dissociates the flow of cost incurrence from the physical flow of product and merchandise, thereby producing a matching of costs and revenue different from the observable flow of cost and physical product on which the logic of Fifo is based. Theoretical justification for the assumption of an unreal cost flow appears to rest wholly on the base stock, unrealized profit theory. The practical justification appears to be that Lifo is the only compromise substitute available for federal income tax purposes and that the tax law permits its use only if it is also used for general financial reporting.

Acceptance of Base Stock Concept. I believe there is ample theoretical and practical justification for the base stock concept in certain instances. A minimum quantity of inventory can unquestionably be identified as necessary to maintain certain types of production operations on a going concern basis. It can be seen in many refining processes and in making steel and glass. The petroleum products in the refinery pipes and the molten metal and glass in the furnaces can be made available for sale only by liquidating the operations in the production process. Remove that quantity of inventory completely and the process is shut down and often can be restored only after a long and expensive period of rehabilitation. The fixed investment in inventory quantities does therefore have some of the characteristics of plant investment. No useful purpose is served by revaluing the fixed base stock quantities at current cost prices from one period to the next; to do so within the framework of the historical cost concept can result in distorting reported information on an enterprise's resources and profit-making activities. Many enterprises engaged in process-type operations with clearly identifiable base stock inventory

characteristics have adopted Lifo as the only compromise method of avoiding revaluations of their base stock quantities that was acceptable for tax purposes.

It cannot be denied that some degree of base stock element exists in many other types of operations. That can be established by the same arguments that resulted in changing the tax law and regulations to extend Lifo beyond unit product applications and dollar-value applications. The base stock quantities in some operations may be more flexible than those of the process-type manufacturing plant. For example, being out of stock in one type of department store's merchandise does not produce the operational difficulties involved in closing down a glass furnace; nevertheless, quantities of displayed stock in a store have some relatively fixed dimensions. Lifo dollar-value applications eliminate the necessity of clearly identifying base stock quantities except in terms of the constant dollar-value layers added since the year of adoption of Lifo.

Extent of Lifo Usage. Many enterprises have adopted Lifo, whether or not they can clearly identify base stock inventory characteristics that might justify its use theoretically, to achieve a better matching of costs and revenue than would result from using Fifo.

The extent to which Lifo is used is indicated from year to year in statistics in the AICPA's annual publication, *Accounting Trends & Techniques*. The 1971 edition shows that 146 of the 600 companies whose 1970 financial statements were reviewed in compiling the statistics disclosed the use of Lifo, as compared with 153 in 1969 and 184 in 1966. In eight industry classifications, 50% or more of the companies whose statements were included used the Lifo basis to some extent, indicating the highest concentration of Lifo users to be in the extractive industries, food processing, and department stores.

The same statistics indicate that Lifo is used by about one out of four of the 600 large, publicly held companies whose statements are covered in the study. Extending the analysis to, say, all the *Fortune* lists of the largest industrial and commercial companies would probably lower the ratio because it would include a greater proportion of companies outside the few industries having the highest concentration of Lifo users. Complexities inherent in the application of Lifo tend to deter its use in many smaller companies. Notwithstanding the apparent gradual decline in users of Lifo, the Lifo–Fifo comparability problem appears to be a continuing one that warrants attention in

efforts to narrow the deficiencies in comparability among financial reports of companies otherwise expected to be comparable.

The Criteria Question. Should we continue to accept Lifo in principle for financial reporting purposes without establishing some criteria for its use? Can practical criteria be established that would require the use of Lifo under certain circumstances?

I believe there is justification for the position that Lifo is preferable to Fifo in certain types of operations—the clearly identifiable base stock type of situation—such as many processing operations. Is it practicable, however, to rule that Lifo is the only acceptable basis of cost flow for that type of inventory? If so, what base year would be selected for those required to adopt it, and what could be done about the continuing lack of comparability inherent in the method even if used by all in a particular industry?

Conversely, only a few companies in some industries have adopted Lifo. Can the one Lifo company in an industry be required to give up significant tax advantages to conform with criteria that eliminate Lifo in that industry classification? There are many such industry situations. In the manufacture of drugs and pharmaceuticals, for example, the costs of newly developed products frequently decline with subsequent technological improvements and greater production volumes, making Lifo less desirable than Fifo as a cost flow basis. Yet a few companies in that industry use Lifo.

It appears, therefore, that industry classifications are not the basis for development of criteria but that more specific circumstances for Lifo's use would have to be spelled out. The Lifo method has inherent complexities that lead me to believe that any degree of limitations on its use through development of criteria may still fail to achieve the desired goal of obtaining comparable reported financial results for companies having substantively comparable circumstances. Further, insurmountable complications in developing criteria result from present tax law restrictions on financial reporting by Lifo users. I finally conclude that it is impracticable to attempt development of criteria for the use of Lifo as apart from either Fifo or specific identification.

Recommendations

I believe we should move off our present position of tacitly condoning the lack of comparability that results from acceptance of both Lifo and Fifo in principle.

The solutions that would probably yield the greatest success in reducing diversities are obviously long range and difficult. The removal of legislative restraints would simplify the entire problem. The uncertainties of obtaining legislative relief from present restraints on financial reporting, which could be secured only at the risk of diluting or extinguishing significant tax benefits, make that solution unlikely.

In discussing the base stock method, Hoffman and Gunders pointed out that at present Lifo is the only cost flow assumption acceptable for income tax purposes that recognizes the base stock, unrealized income theory. They concluded:

> This situation is regretted because the base stock method does not have the shortcomings inherent in the LIFO method.
>
> Conceivably, an appropriate adaptation of the base stock principle may at some future date be developed which will become generally accepted for use by both processors and manufacturers in computing taxable income as well as for financial reporting.[10]

I concur in that view and urge that long-range steps be taken to eliminate tax law prohibitions against use of the base stock method.

During the interviews of financial executives of industrial organizations and their independent accountants, many were asked what they considered to be the primary reason why companies used Lifo. Excepting the extractive industries, the answers were almost unanimously to the effect that income tax advantage was the sole purpose of Lifo's use. The view was expressed generally that a great majority of those using Lifo for tax purposes would switch to Fifo for general financial reporting purposes if permissible under tax law.

For the short-range solution to the cost flow question, I believe authoritative pronouncements on inventory should be revised along the following lines:

1. Describe the circumstances in which specific identification of costs is most acceptable—situations in which inventory items are not interchangeable and are acquired or produced as single units that can be readily identified throughout the manufacturing or merchandising processes.

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[10] Raymond A. Hoffman and Henry Gunders, *Inventories—Control, Costing, and Effect Upon Income and Taxes,* Second Edition (New York: The Ronald Press Company, 1970), p. 173.

2. Establish Fifo as the basic concept of cost flow assumption if specific identification of costs is not used (either because it is impracticable or because it fails to provide an acceptable basis of matching costs and revenues).

3. Recognize that in some circumstances an assumed cost flow such as Lifo (or base stock) is a logical basis for avoiding possible distortions of income from fluctuations in the current cost of basic fixed inventory quantities.

4. Require full disclosure of the basis used if the Fifo cost flow assumption is not used.

5. Require disclosure of the extent of application of Lifo (or base stock type cost flow assumptions) and the effects of its use *as compared with the Fifo basis* on both net income of the year and balance sheet inventory amounts with appropriate disclosure of related tax allocations.

Those points are incorporated in the coordinated recommendations for revision of *ARB 43*, Chapter 4, set forth in Chapter 9 of this study.

7

Lower of Cost or Market

Departures from Cost

Generally accepted accounting principles provide for the use of inventory valuation bases other than cost under two types of circumstances:

1. if a loss in usefulness of inventories is recognized by applying the rule of lower of cost or market, and
2. if it is impracticable to determine the unit costs of certain types of products having the characteristics of interchangeability and assured selling prices.

Review of the literature and practice in those two areas disclosed diversities in practice which appear to result from differing interpretations as to how the exceptions should be applied as well as controversies over the theoretical base of the present lower of cost or market rule.

Lower of cost or market is discussed in this chapter in terms of its application to all types of inventories of manufactured products and merchandise. Other departures from the cost basis are discussed in Chapter 8.

The Present Rule

Background. Historians differ as to the origin of the rule of lower of cost or market but generally agree that it has been used since the Industrial Revolution and, further, that it developed to meet the need for businessmen to take into account the forces in one period affecting

the price of goods to be sold in a future period. The notion relates the usefulness of inventory items to the enterprise's ability to dispose of them at a profit. Further, if something occurs that diminishes the normal profit function of inventory, the loss of usefulness of the affected items should be accounted for in the period in which it occurs. Under that notion, retaining the cost basis of items fails to achieve proper matching of costs and revenue.

Basic Rule. *ARB 43*, Chapter 4, Statement 5, states:

> A departure from the cost basis of pricing the inventory is required when the utility of the goods is no longer as great as its cost. Where there is evidence that the utility of goods, in their disposal in the ordinary course of business, will be less than cost, whether due to physical deterioration, obsolescence, changes in price levels, or other causes, the difference should be recognized as a loss of the current period. This is generally accomplished by stating such goods at a lower level commonly designated as *market.*

Lower of cost or market is included in *APB Statement 4* as one of the specific rules requiring the recording of unfavorable events that decrease market prices or utility of assets.

Conservatism. *APB Statement 4* also identifies the rule as an illustration of one of the modifying conventions that have evolved because rigid adherence to the pervasive principles sometimes produces results that are not considered desirable and that may exclude from financial statements some events that are considered to be important. The convention of conservatism is described in *APB Statement 4*, paragraph 171.

> *Conservatism.* Frequently, assets and liabilities are measured in a context of significant uncertainties. Historically, managers, investors, and accountants have generally preferred that possible errors in measurement be in the direction of understatement rather than overstatement of net income and net assets. This has led to the convention of conservatism, which is expressed in rules adopted by the profession as a whole such as the rules that inventory should be measured at the lower of cost and market and that accrued net losses should be recognized on firm purchase commitments for goods for inventory. These rules may result in stating net income and net assets at amounts lower than would otherwise result from applying the pervasive measurement principles.

Theoretical Arguments

Criticisms. Proposals for authoritative pronouncement of the rule of lower of cost or market in the early 1940s gave rise to numerous criticisms by theorists. The principal objections to the rule centered around its violation of the historical cost principle. William A. Paton's article, "The Cost Approach to Inventories," criticized the rule as representing profit management rather than profit measurement and stated that maintaining future profits should be a managerial problem, not the direct function of the accountant.[1] A. C. Littleton gave the same view in a letter.[2] He stated that the objective of carrying forward a commodity is to derive revenue when and if sold, and while it is hoped the revenue will exceed cost, it is not the function of accounting to make hopes into assurances. George R. Husband took the same position in his article, "Another Look at Cost or Market Whichever Is Lower."[3]

Defenses. Support of the rule's rationale argued that an exception to the historical cost basis was warranted because it served the useful purpose of achieving better matching of costs and revenue. George D. Bailey supported the rule in an article, "Problems of Inventory Pricing," on the grounds that inventory is the sine qua non of business and that the element of profit is inseparable from inventories. He argued further that if the normal function of inventories is profit, anything that dislocates the profit flow needs to be accounted for in the period in which the dislocation occurs.[4] Maurice H. Stans followed the same reasoning in an article, "Inventory Pricing." He argued that the ability to be disposed of at a profit constitutes the usefulness of an inventory commodity and that the inventory amount measures that portion of the period's stream of incurred costs which can reasonably be applied to revenue of the future with profit-making effect.[5] The support in recent years concentrates more on the rule's usefulness in avoiding overstatement of expected economic benefits through retention of historical cost if the utility value of the inventory items has declined.

[1] *The Journal of Accountancy,* October 1941, pp. 300-307.
[2] *The Journal of Accountancy,* April 1946, pp. 333-334.
[3] *The Accounting Review,* April 1946, pp. 115-120.
[4] *The Journal of Accountancy,* August 1941, pp. 143-148.
[5] *The Journal of Accountancy,* February 1946, pp. 98-106.

Practical Attitudes

Users. The extent to which users of financial information favor lower of cost or market is illustrated in a recent NAA research study. The following question and responses show considerable support by two important classes of users:

> . . . bankers and security analysts interviewed were asked the following question:
>
> In terms of your investment or credit decisions, do you think the lower of cost or market rule is useful and justified?
>
> All but one of the 74 bankers interviewed favored the lower of cost or market rule. When questioned to elicit their reasons, they usually pointed out that bankers adhere strongly to the doctrine of conservatism. . . . From the banker's point of view, the lower of cost or market rule provides a protection against subsequent unpleasant surprises and reduces his risk.
>
> The security analysts also overwhelmingly supported the lower of cost or market rule. Only four of these 72 analysts interviewed opposed the rule. This is perhaps surprising since analysts, unlike bankers, are primarily interested in income. This virtually unanimous endorsement clearly indicates that analysts feel that the lower of cost or market rule contributes to usefulness of periodic income measurement. In justification, these analysts repeatedly stated that in making income projections it is important to start with a conservatively constructed income base.[6]

The corporate executives and accounting firm partners interviewed during this study expressed almost unanimous support for the rule's concept.

Author's Concept

I accept the concept of lower of cost or market on the theory that the element of profit is inseparable from inventory and that the profit-making potential of inventory items measures their utility value. Each dollar of incurred costs in inventory is invested because of its profit-making potential, and a loss in its utility value occurs when it becomes evident that the planned profit function of an inventory item is reduced because of a decline in the margin between acquisition cost and anticipated selling price.

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[6] Morton Backer, *Financial Reporting for Security Investment and Credit Decisions* (New York: National Association of Accountants, 1970), p. 102.

Measuring Losses Under the Rule

Replacement Cost with Limits. The present rule states in Chapter 4 of *ARB 43* that replacement cost by purchase or reproduction—"market," in the language of the rule—is to be used in measuring the residual usefulness of inventory. However, the rule places two limits on replacement cost by providing that the amount of losses calculated on that basis should not result in carrying the inventory at an amount that (1) exceeds net realizable value or (2) is lower than net realizable value reduced by an allowance for an approximately normal profit margin. The term *net realizable value* is described as estimated selling price in the ordinary course of business less reasonably predictable costs of completion and disposal. The intent of the rule is to provide a means of measuring the residual usefulness of an inventory expenditure. Explanatory wording states that the rule should be considered a guide rather than a literal rule. *ARB 43* states specifically that judgment must always be exercised in applying the rule and that no loss should be recognized unless the evidence clearly indicates that a loss has been sustained.

Present wording of the rule states that, depending on the character and composition of the inventory, the rule may be properly applied to each item or to the total of inventory or, in some cases, to the total of each major category of inventory components. The discussion in Chapter 4 of *ARB 43* reemphasizes that the purpose of reducing inventory to the market basis is to reflect fairly the income of the period and that the method selected should be the one that most clearly achieves the purpose.

Measurement Problems. Real practical problems exist in applying the present rule because of its complex requirements and guides. For example, if potential loss is indicated by declines in selling prices, is it mandatory to calculate replacement or reproduction costs of all affected inventory items to establish the loss measurement within the three point dimensions of the present rule? Or is it necessary to calculate net realizable values of all end products into which the enterprise might fabricate its inventory of a raw material whose current replacement cost has declined? Other controversies have arisen over applying the rule to items, to categories, or to total inventory.

Theoretical controversies exist over whether declines in replacement costs should be used to measure losses since they may not result in losses in net realizable value of the end products. Some theorists, as well as some practitioners, argue over the meaning of net realizable

value and whether there is ever justification for writing down inventory to a basis reflecting net realizable value less an approximately normal profit margin. Most writers on the subject agree that a better basis of determining market is needed.

Those controversies have given rise to charges that the present rule provides managements with opportunities to manipulate profits between periods.

Practical Application. The problems of applying the present rule to real-life situations are probably more significant than appear on the surface. Relatively few accountants have been faced with a substantial problem in the last twenty-five years of rising price trends. Many accounting executives interviewed said they considered that there are two basic situations in which loss of utility value of inventory should be recorded: first, if the replacement costs of materials and services entering into production costs have declined; second, if anticipated selling prices of products and goods have declined. In the first, the replacement cost of the materials or labor involved is used to calculate the loss and—if material in the circumstances—to carry the loss calculation to the affected component contents of the work-in-process and finished inventories. In the second, the loss is calculated on the basis of net realizable value resulting from the lower anticipated selling prices. If write-downs of finished product inventory amounts are significant, losses are computed for related work-in-process inventories and, in some unusual cases, for related major raw materials inventories. Many executives interviewed, however, were not familiar with the fact that the present rule prescribes replacement cost as the primary measure of market, with a ceiling of net realizable value and floor of net realizable value less an approximately normal profit margin.

Our interviews disclosed diverse opinions and practices on how to determine net realizable value for calculating losses under the rule. The principal differences related to the extent to which provision should be made for general selling and administrative expenses and for profit margins.

The interviews with accounting executives and partners of accounting firms led to the conclusion that, although the lower of cost or market rule is strongly supported by practitioners, they evidence a surprising lack of understanding of the present rule both in implementation and in concept. Replacement cost seems to be accepted somewhat blindly as the measure of loss in utility value of raw

materials without applying the rule's tests to determine whether the net realizable value basis of measurement indicates that a loss will be sustained. Some practitioners argue against providing for normal profit margins in calculating losses on the net realizable value basis but fail to recognize that applying the replacement cost basis without the rule's limitations on its use may result in recording losses that provide greater than normal profit margins. An unavoidable conclusion is that some clarification of the present rule might narrow diversities of practice in applying the rule.

Theory of Measuring Losses. Controversies over measuring losses under the rule generate principally from varying interpretations of the market concept. Essentially, the arguments reduce to a consideration of recoverable cost or net realizable value on one hand versus replacement cost or its general equivalent of net realizable value less a normal profit on the other. Several early critics of the rule argued that changes in replacement costs are not conclusive evidence of selling price changes and are therefore not sufficient evidence of probable loss in utility value.[7] Proponents of the replacement cost basis admitted that declines in replacement cost may not always result in realization losses but argue that they do in many cases. Proponents also stressed the objectivity of the replacement cost basis. The rule, *ARB* 29 issued in 1947, shows evidence of the conflicting views:

> . . . no loss should be recognized unless the evidence indicates clearly that a loss has been sustained. . . . Replacement or reproduction prices would not be appropriate . . . when . . . realizable value . . . more appropriately measures utility. Furthermore, where the evidence indicates that cost will be recovered with an approximately normal profit . . . no loss should be recognized. . . . .

Further evidence of some of the thinking of those who drafted the original pronouncement is shown in an article by George D. Bailey (a member of the committee on accounting procedure which drafted the bulletin):

> The committee could do no less than to recognize the reduction to a point which does provide some gross margin per unit, because such a profit allowance is inherent in the long established basis

[7] A. C. Littleton, "Inventory Variations," *The Journal of Accountancy*, July 1941, pp. 7-16; Lawrence L. Vance, "Earning-Power Valuation of Inventory," *The Accounting Review*, October 1942, pp. 376-384.

> of replacement cost for inventories and in the retail-inventory method. . . . If the committee had taken the position that inventories should not be written down to a point which allowed for a profit per unit, then in logic it might well have had to find the replacement-cost method unsound and to condemn the retail-inventory method.[8]

It is worthy of note that writers on the subject many years later still use the comparison of the retail inventory method as an argument that the rule actually favors calculating market on the basis of net realizable value less normal profit margin.[9]

The Canadian Institute of Chartered Accountants (CICA) published a research study in 1963 in which the author established that the essential point of theoretical difference is whether the adjustment of inventories to market should allow for maintaining a normal gross margin in the period of sale.[10]

In arriving at her conclusions, Miss Mulcahy pointed out that consistent use of the replacement basis without limits may produce unreasonable results and that accordingly the only reasonable choice of interpretation of the meaning of market seems to be between net realizable value and net realizable value less normal profit. Miss Mulcahy's conclusion reads:

> In the author's opinion, if the lower of cost and market basis of inventory valuation in the ordinary course of business operations is to be used, market should be limited to net realizable value since this is the most reasonable interpretation from the point of view of both income measurement and balance sheet presentation.
>
> Adherence to the net realizable value interpretation of market may create problems in certain cases when it comes to valuing the raw materials portion of inventories. Since realizable value relates to the selling price of the finished product, it requires the conversion of the quantities of various raw materials on hand into equivalent units of finished goods. In many cases, this would be an almost impossible task because of the wide variety of raw materials on hand. In contrast, the replacement costs of this portion of the inventory can be determined without too much diffi-

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[8] "The Increasing Significance of the Income Statement," *The Journal of Accountancy,* January 1948, p. 17.

[9] For example, H. Dwight Geiger, "Needed: A New Definition of 'Market'," *Financial Executive,* June 1966, p. 38.

[10] Gertrude Mulcahy, *Use and Meaning of "Market" in Inventory Valuation* (Toronto: CICA).

> culty and may provide some indication of long term trends in selling prices. By reason of expediency and practicality, it would seem logical to modify the recommendation for the use of net realizable value to permit the use of replacement cost for the raw material portions of the inventory. This modification should not be interpreted as meaning that the lower of cost and replacement cost could be used in all valuations of raw materials. Unless there is clear evidence that the selling price of the finished product has or is expected to decline below the costs incurred in acquiring or producing and selling the product, there should be no departure from cost in valuing the raw materials. Replacement cost becomes relevant only when it is apparent that a loss will be experienced on the disposal of the finished goods produced from the raw materials in inventory and, under such conditions, replacement costs are used only as convenient and practical indexes of potential cost recovery.[11]

Thus she recommends revising the present rule to require net realizable value and to avoid write-downs which maintain normal profit margins on disposal of the affected inventory. The use of replacement cost would be permitted only for the sake of convenience and practicality.

Application to Items, Categories, or Total Inventory. Arguments exist over the present rule's option to measure losses by applying the market test to items, categories, or total inventory, whichever method "most clearly reflects income." Critics argue that the wording of the present rule gives rise to potential wide differences in practice and provides so-called free choices which permit manipulation of profits. Responses are that the rule presents a reasonably concise and comprehensive essay on the points intended to be considered in applying the rule and that, if those points are combined with the tenor of the admonitions in earlier sections of the present rule's wording, the overall intention is clearly one of developing a rational and objective approach to loss measurements.

Conclusions on Measuring Inventory Losses. I believe that since profit potential provides the utility value of inventory, it is also the essential element in measuring losses in that value. There are three reasons why the replacement cost basis of measuring losses fails to provide an appropriate matching of costs and revenue:

1. To account for inventory on a lower current replacement cost basis results in the use of an arbitrary and unrealistic

[11] *Ibid.*, p. 20.

measurement basis in circumstances in which more realistic and objective measurements are practicable.

2. Since replacement cost decreases may or may not be accompanied by selling price declines, they do not necessarily measure losses in utility value.
3. The replacement cost concept inherently contemplates recording losses in one period in amounts that permit disposal of the affected inventory at normal profit margins in a future period.

I believe potential loss in utility value of inventory cannot be objectively measured until management decides what course of action will be taken with respect to the affected items. An anticipated net realizable value can be established at that point for comparison with the cost basis of the affected items to determine the extent to which there has been a loss. I believe that no useful purpose is served by increasing the amount of a current period loss so determined by the amount estimated to provide normal profit margins on the disposal of the affected items in a future period. Finally, I believe that the qualitative objectives of verifiability and neutrality of accounting information can be met in implementing the net realizable value basis of measuring inventory losses even though the method relies heavily on management judgments in making the necessary projections of costs of completion and selling prices.

Reliance on Management Judgment

Recognized Need. The need to rely on management judgment in applying the lower of cost or market rule has been recognized since the rule was first authoritatively pronounced in the late 1930s. The desire to decrease reliance on management judgment and to increase objectivity and verifiability in applying the rule was apparently a major factor in drafting the rule so that replacement cost is the primary method of measuring inventory losses. The rule was drafted when some of the important early developments were taking place in the use of accounting information in management decision making and for management controls; accountants were beginning to recognize the need for reliance on management internal controls as a major factor in the production of reliable accounting information. There has been great progress since the 1930s in developing accounting into the rational, analytical processes (described in Chapter 4) that provide

the present-day environment in which the accounting basis of inventories is determined. I believe the progress since the rule was instituted justifies placing greater reliance on management judgments that would be involved in making net realizable value the primary basis of measuring inventory losses.

The same problems of objectivity and use of management judgments are also recognized by some accounting theorists. Sprouse and Moonitz (who reject lower of cost or market in favor of valuing most inventories at replacement cost) recognized the problem of objectivity and recommended integrating its practical aspects into underlying principles:

> Other changes occur [in transactions affecting assets and liabilities], however, such as movements in the market prices (e.g., replacement costs, or selling prices) of specific goods and services as well as movements in the general level of prices.
>
> If these other changes are to be recognized, how can they be measured? The "imperative" on objectivity states that changes should not be recognized "earlier than the point of time at which they can be measured in objective terms." Even when rephrased in positive fashion to state that changes should be recognized "at the earliest point of time at which they can be measured in objective terms" the "imperative" requires objective measurement. Accounting, however, already uses a wide range of measures—replacement costs in "cost or market" calculations, index numbers of specific commodities or groups of similar commodities in "dollar-value Lifo," estimates of net realizable values in accounting for by-products, for obsolete or obsolescent goods or equipment and the like, as well as canceled checks and unpaid invoices. The use of this wide range of measures is definitely in accord with the function of accounting and should be integrated into its principles.[12]

Management Cost/Price Planning Processes. Every management is involved in a continuing process of planning profit potentials, formally or informally, that requires projecting cost/price relationships such as comparing anticipated competitive selling prices with projected unit product costs. That necessitates estimates of the extent to which sales of individual products or product lines will provide margins above manufactured costs to cover the direct selling expenses and the allocable portions of general selling and administrative expenses and to yield overall net profit margins.

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[12] Robert T. Sprouse and Maurice Moonitz, *Accounting Research Study No. 3*, "A Tentative Set of Broad Accounting Principles for Business Enterprises" (New York: AICPA, 1962), pp. 12-13.

The changes that occur in various product cost components and in planned sales prices may be generated from either internal or external causes. Internal (rather than external) cost reductions often cause cost/price realignments in industries that are highly research-oriented. Product costs may be reduced through technological changes in product design or production methods. Frequently lower sales prices are offered to customers voluntarily to gain a competitive selling advantage. Price reductions are a rather common occurrence in a field such as electronics or pharmaceutical and biological products. Management is ordinarily able to control the timing of price reductions generated internally so that the realignments of the new cost/price relationships do not necessitate significant inventory write-downs.

Many externally caused changes in cost/price relationships, however, are more abrupt. A reduction in the price of copper, for example, can be expected to be reflected in lower prices for brass rod almost immediately, and if a manufacturer does not reduce the price, customers will soon be buying elsewhere. Immediate cost/price realignments deemed necessary may result in serious dislocation of the planned profit potentials in product inventories on hand at the time.

Relevant Cost Data. Various methods of developing cost accounting data underlie cost/price decisions, but they seek one common objective. That is to provide data for projecting costs and selling prices of particular products as affected by changing conditions and relating them to the overall profit plan of the enterprise. Projections may be only in terms of broad product lines in the continuing profit-planning process. If cost/price relationships are disturbed by unplanned selling price reductions, however, it usually becomes necessary to project unit product costs of the manufacturing *and* marketing of affected products. That involves allocation of both manufacturing and nonmanufacturing costs to products. The resultant total unit product costs can then be compared with projected selling prices. Total unit cost analysis, in other words, permits management to determine how much margin above manufactured cost a product must contribute to cover its share of all projected commercial costs of the period and to provide a profit. Analyses and projections of cost/price relationships (whether formal or informal) form the basis on which management decides on a course of action when changes occur in either input or output prices.

Complexities of Cost/Price Decisions. Let us consider, for example, a few of the courses of action management might take for a

manufactured product affected by a significant decline in competitive prices:

1. Discontinue manufacturing the product and dispose of the present stocks at prices equal to or lower than the projected competitive selling prices.
2. Discontinue manfacturing the product but continue it in the line by purchasing requirements from other sources at costs lower than projected manufacturing costs.
3. Continue to manufacture and sell at the projected lower competitive prices, recognizing that a new and less profitable cost/price relationship has been established for the product.
4. Continue manufacturing the product but redesign it to reduce costs of manufacturing and marketing to the point of restoring the former cost/price relationship.

Is it practicable in that situation to determine an inventory loss of any kind before management decides on a specific course of action? The situation illustrates the almost inextricable relationship between management cost/price planning and the determination of a loss of usefulness of inventories due to either input or output price declines. Finally, it is difficult to arrive at an intelligent decision on a course of action without projections of net realizable values. The reasoning leads to the conclusion that net realizable value should be the primary basis of measuring inventory losses under the cost or market rule.

Practical Problems in Measuring Net Realizable Values

Projections. *ARB 43,* Chapter 4, describes net realizable value only in the broad terms of "estimated selling price in the ordinary course of business less reasonably predictable costs of completion and disposal." Relatively few questions have been raised as to the overall meaning and intent of that description of the term. The accepted concept of net realizable value therefore recognizes the need to project selling prices and related costs of completion and disposal in circumstances considered to prevail in the ordinary course of the enterprise's business. Our review of literature and practice disclosed no significant questions as to either the meaning or the practicability of determining costs of completion. Significant differences in opinion and practice do exist,

however, as to the meaning of the term *costs of disposal* in the ordinary course of business.

Costs of Completion. Costs of completion are generally interpreted to mean additional costs to be incurred in bringing the goods or products to the state of completion and salability in which they are ordinarily offered to customers. In manufacturing or processing operations, the cost of completion of work-in-process inventories would necessarily require projection of costs of additional required materials and of labor and manufacturing overhead allocable to the required additional production and processing operations. Let us take the cost of completion back one step—to purchased components and raw materials acquired specifically for use in producing the products suffering the decline in selling price. If the management decision is to use them for manufacturing to continue the product in the line, the cost of completion is projected for all conversion costs involved. Projections of the foregoing types are fairly routine assignments even for relatively unsophisticated management accounting operations.

Costs of Disposal. Opinions on provisions to be made for costs of disposal range from identifying direct costs to allocating selling, general, and administrative costs. The costs involved are conventionally accounted for in broad functional classifications of shipping, advertising, selling, general and administrative, and, in some cases, general research and development. They are accounted for as expenses of the periods in which they are incurred and are matched against revenue of the period for income determination. Conventional classification of the costs for control purposes usually provides identification by types and functional relationships. Relatively few of the costs are normally identified as direct or variable by product or product line or by transaction. The others are considered indirect in nature and allocable to products and product lines only on the basis of functional relationships.

Direct Disposal Costs. Those who favor providing for only the direct costs of disposal argue that the intent of the rule is to reduce the anticipated selling price by the amount of cash outlay necessary to dispose of the inventory and to compare the anticipated net cash realization with cost to determine potential loss.

There is little argument against the practicality of identifying direct costs of disposal. Certain warehouse and shipping expenses, such as handling, packing, and transportation costs, may be specifically identified with disposal of the products in question. The same is true of

selling expenses, such as commissions and other types of direct sales compensation, and certain general and administrative costs, such as order writing and credit and collections.

The question raised regarding net cash recovery measurement is whether it is consistent with the rule's stated purpose of measuring loss in utility of goods in their disposal "in the ordinary course of business." The net cash recovery basis is accepted as appropriate if the goods are to be disposed of on a salvage basis. But if they are to be sold in the ordinary course of business, it is argued that their utility value should be measured in terms of anticipated selling price less sufficient margin to cover an allocable share of the general selling and administrative expenses of the period in which they will be marketed.

Full Allocation of Commercial Expenses. The arguments against the net cash recovery basis consider that in the ordinary course of business (as reflected in a conventional income statement) all commercial or nonmanufacturing costs are expenses of the period in which they are incurred. They are thus allocable to the products sold during each period for purposes of a periodic analysis of the operation. In practice, commercial expenses are allocated to products to provide data needed for management's cost/price decisions.

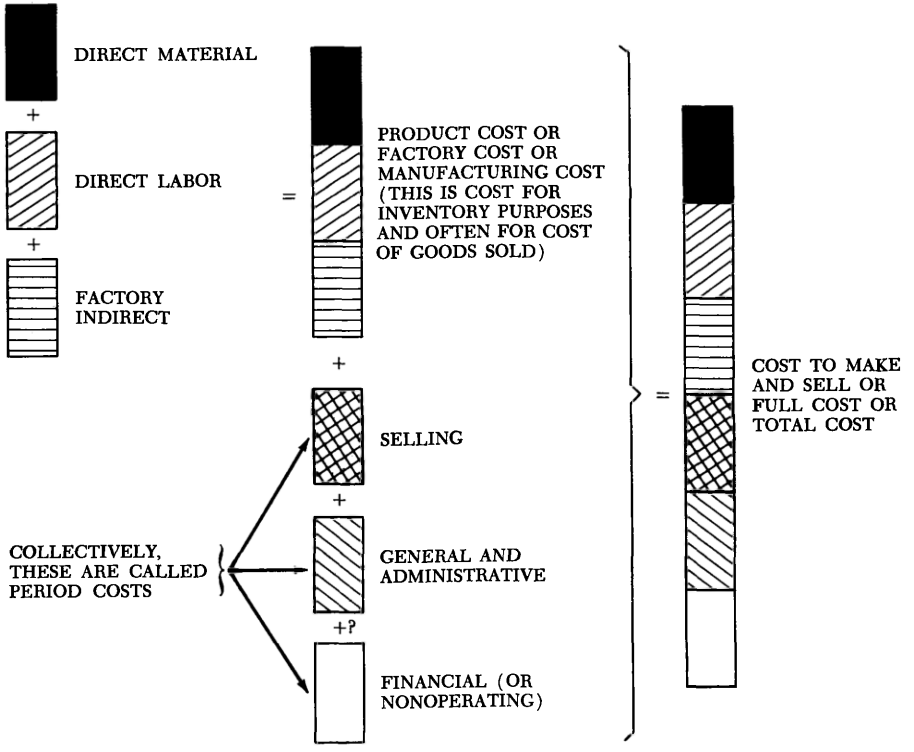
Total Cost for Price Decisions. Many writers on the subject of cost/price relationships discuss allocation of nonmanufacturing—or commercial—expenses to costs of products or product lines as an element in pricing decisions. Some refer to it in terms of arriving at a total cost from which to project a desired selling price or to compare cost with potential competitive selling prices. Others describe the allocation of commercial costs as part of the process of projecting the amount of profit contribution above manufactured cost (sometimes above variable or direct manufactured cost) that particular product lines and products should be providing in the overall profit planning. Exhibit 7-1 illustrates the total cost concept as set forth by Robert N. Anthony.[13]

The nonmanufacturing costs allocable to products in the illustration of the total cost concept can be described as expenses of maintaining the enterprise's capacity to develop and merchandise its products and administer overall profit-making activities. The concept is compatible with that described for merchandising enterprises (page 120) in

[13] *Management Accounting Principles,* Revised Edition (Homewood, Ill.: Richard D. Irwin, Inc., 1970), p. 128.

EXHIBIT 7–1

Elements of Cost



which all operating functions are considered merchandising-oriented and the costs are traditionally classified as period expenses.

Author's View. If net realizable value is considered to be the primary measure of losses in inventory utility (as recommended earlier), I believe that net cash recovery should not be used for inventory items that are to be disposed of in the ordinary course of business. Conventional management practices determine the ordinary course of business. Cost/price decisions are made in the ordinary course of business on the basis of anticipated margins between cost and selling price. If an enterprise's planned cost/price relationships are dislocated by events such as price reductions at the input or output level, new margins are considered in arriving at the course of action to be taken. Losses will be recorded in the future period of disposal if the new margins planned for the affected items would not be sufficient to cover their allocable share of the commercial expenses of the period. Recording the full amount of losses in the period in which

the price declines occur can therefore be accomplished only by calculating the net realizable value at anticipated selling price less appropriate provision for an allocable share of the commercial expenses of the period in which the affected items are to be sold.

Adoption of the recommended net realizable value concept would limit reductions in inventory due to market price declines to the level at which it is anticipated that the affected items can be sold on a break-even basis in the ordinary course of business. The intent would therefore be to preclude recording in a current period inventory losses that would create profits on the items in a future period. Marginal pricing situations would need to be considered in drafting a rule to achieve that result.

Other Problems with Net Realizable Values

Marginal Pricing. Management sometimes deems it prudent to offer customers certain products at prices that do not provide a margin above costs sufficient to cover allocable commercial expenses. The practice is sometimes referred to as marginal pricing, indicating that the revenue from the sale of the product is sufficient to cover its cash outlay cost but not all of its share of the fixed costs that would normally be allocated to it on a total product cost basis. Management may logically justify that basis for several reasons. One may be to meet competitive prices on items representing a minor part of a large product line being sold to important customers. The marginal pricing basis may be justified under an opportunity cost concept—temporarily absorbing a portion of fixed costs that would otherwise be lost because of excess capacity. If a lower of cost or net realizable value rule were applied to recognize further price declines on products priced on a marginal basis, it would require write-downs creating current period losses. Those losses would have the effect of increasing future profits beyond planned normal levels by allowing the affected inventory to be disposed of on a break-even basis. The solution is to prohibit a write-down that increases the anticipated margin above cost over that experienced in the ordinary course of business prior to the selling price decline.

Application to Individual Items, Categories, or Total Inventory. The adoption of net realizable value as the primary basis for measuring inventory losses would eliminate most of the questions as to whether the rule should be applied to individual items, categories, or

total inventory. Net realizable values can be determined objectively only after management has adopted a course of action on disposition of the end products affected by anticipated selling price reductions. Identification of the components of the affected end products is inherent in the process of determining the course of action leading to lower anticipated net realizable values. The rule could therefore be positive in its prohibition against offsetting losses on affected portions of an inventory against normal cost/price margin gains expected to be realized on other end-product portions of the inventory that are unrelated to the affected portions.

Reconciliation with the Retail Inventory Method

One final question on net realizable value needs consideration: How can it be reconciled with the retail inventory method? The ordinary operation of the retail inventory method can be interpreted as providing normal average departmental profit margins on the total retail value of a department's inventory, including merchandise that has been marked down. If the effect is to reduce the basis of the marked-down merchandise to a level providing approximately normal profit margins, how can it be justified under a net realizable value rule? The answer is partly a matter of practicality, but I believe the question can also be reconciled conceptually. In the discussion of the retail inventory method beginning at page 121, I present my views as to why I believe that it is neither feasible nor necessary to require special adjustment of the retail inventory method to conform its results with those obtained in applying the recommended lower of cost or net realizable value to other types of inventory.

Recommendation

I believe loss in the utility value of inventories should be accounted for in the period in which it becomes evident, and measurement of the loss on the basis of net realizable values is practicable of application and produces a more appropriate matching of costs and revenue than is obtained if market is equated with replacement costs. Accordingly, I recommend that the term *net realizable value* be substituted for the term *market* in the common statement of the rule and that the rule be restated along the following lines:

Recognition of loss in utility value of inventories. A departure from the cost basis of pricing inventories is required if the utility value of inventory is less than its cost. If there is evidence that the utility value of inventory items in their disposal or use in the ordinary course of business will be less than cost, the difference should be recognized as a loss of the period in which it is determined. That is accomplished by reducing the cost basis of the affected items to their net realizable value. For purposes of implementing the principle, *net realizable value* is anticipated selling price less (1) costs of completion and (2) appropriate allocations of the marketing, administration, and general costs (commercial expenses) that the enterprise ordinarily accounts for as expenses of the periods in which they are incurred. Implementation of this principle of lower of cost or net realizable value should not increase the margin between the expected selling price and the reduced cost basis of the affected items beyond that existing immediately prior to the discovery of the factors which give rise to the reevaluation of the inventory amounts.

The descriptive and explanatory comments on the rule should include these five points:

1. Loss of utility value in inventories may arise through physical deterioration, obsolescence, unbalanced inventory positions as to materials and end-product components, or excess stocks in relation to changing consumer demands. The existence of potential losses may be detected through external reductions in acquisition prices (input), or in selling prices (output), any of which conditions and events may dislocate existing and planned future cost/price relationships and profit potentials.

2. While those events indicate potential losses in the utility value of inventory, the earliest point at which losses can be measured objectively is the date when management adopts, or commits itself to, a planned course of action relative to the use or disposal of the products affected. Only then can the resultant planned net realizable values under the realigned cost/price relationships be determined.

3. The concept of providing for an amount above the inventory cost sufficient to cover allocable commercial ex-

penses of the disposal period should be explained, stressing the point that those amounts should not provide for future profits and that those amounts should be provided for only if it is contemplated that the products are to be disposed of in the ordinary course of business.

4. Limitations of the rule, such as those relating to prohibitions on offsetting losses against margins in unaffected and unrelated portions of the inventory, should be clearly set forth. The limitations on applying the rule to items that have not provided sufficient margin above cost to cover allocable commercial expenses should also be clearly set forth.
5. There should be an explanation of the reasoning underlying the acceptability of the calculation of net realizable values on a departmental basis in the ordinary operation of the retail inventory method.

8

Special Problems

Introduction

The fundamentals of product cost determination in general manufacturing operations, as discussed in Chapters 4 and 5, are typical of those that apply to the determination of costs for a wide range of products and services. The cost flow assumptions and the applications of the lower of cost or market rule, as discussed in Chapters 6 and 7, likewise are fundamental to inventories of enterprises engaged in almost all types of production and merchandising. Certain production and merchandising operations, however, have features that create inventory accounting problems requiring special treatment. Several broad types of activities are discussed in this chapter to explore the extent to which earlier recommendations need expansion or annotation to recognize special problems. These categories are:

Merchandising enterprises

Extractive industries

Cost-recovery-type contracting

Market value for certain extractive and agricultural products

Hedging by grain merchandisers and processors.

The discussions in this chapter do not purport to be complete evaluations of the theory and practice involved in the special areas. Rather, they are summarizations which highlight for the informed reader the extent to which the activities require special recognition in authoritative pronouncements on inventory accounting.

Inventories of Merchandising Enterprises

Two areas peculiar to merchandising warrant some inquiry from a theoretical standpoint. One is whether conventional merchandise cost practices are compatible with sound cost concepts. The other is whether the retail inventory method produces an acceptable implementation of the lower of cost or market rule.

Merchandise Cost Concept. The conventional merchandise accounting practice, as described in Chapter 4 (page 33), considers the purchase cost of merchandise plus costs of inbound transportation and delivery as the basis for calculating cost of merchandise sold and for the accounting basis of inventories. All costs related to the functions of purchasing, inbound inspection, handling, and warehousing that are necessary to bring the merchandise to the point of sale are accounted for as period expenses. Typically, no part of those costs is allocated to merchandise in calculating the cost basis of inventories. A theoretical question is sometimes raised as to whether the practice is in conflict with the basic concept set forth in *ARB 43*, Chapter 4, which describes cost as "the sum of the applicable expenditures and charges directly or indirectly incurred in bringing an article to its existing condition and location." A further question is sometimes raised as to whether the concept of merchandise cost is inconsistent with concepts of cost for manufactured products, in which most comparable indirect purchasing and handling costs are allocated to materials and product costs.

There appears to be little question that some theoretical conflict is involved. The justification for conventional practices is strictly one of practicality. The philosophy that the entire organization and operation of a merchandising enterprise constitute support for the selling function underlies the merchandising view to some extent. Operationally, the buying function in many merchandising organizations is performed by managers of selling departments or divisions. That makes separation of costs between buying and selling impracticable. It is also usually considered impracticable to attempt allocation of functional costs such as warehousing and handling because of the complex assortment of merchandise that many retailers and wholesalers handle.

I conclude that the conventional merchandise concept of cost is adequate and that there is little useful purpose served by attempting to allocate costs of purchasing, warehousing, etc., for inventory purposes. That view is consistent with that of giving primary emphasis to functional patterns of organization in calculating costs of manufactured products.

Retail Inventory Method. The wide range of cost identification problems in pricing a merchandise inventory is discussed in Chapter 4 (page 33). It is noted there that specific identification of merchandise cost becomes impracticable in department store operations because of the large volume of merchandise sold in small quantities and at varying rates of turnover.

A practical solution to the problems of matching costs and revenue in that type of operation, known as the retail inventory method, was developed many years ago and has been used extensively in department stores and, to a limited extent, in other operations having similar merchandising characteristics. In effect, the method identifies costs of merchandise sold or on hand according to the marked retail selling prices. The system thus provides an automatic reduction of costs to recognize lower realizable values if selling prices of merchandise have been reduced. Some theorists argue that the retail inventory method inherently provides for lower of cost or market write-downs to a basis of net realizable value plus provision for approximate normal profit margin. That raises a question as to whether it is necessary to require special adjustment of the retail inventory method to conform its results with those obtained in applying this study's recommended net realizable value write-down to other types of inventory. The following explanation of the workings of the retail inventory method and its importance to the merchandising industry are presented to give the reader further insight into the complexities of the problem.

Hoffman and Gunders[1] describe the retail inventory method as consisting of the accumulation of the retail selling value of all items entering into the departmental merchandising operations in a manner that enables a reduction of the retail amounts to a cost basis through the application of average departmental gross markup percentages. Exhibit 8-1, page 122, shows the book's illustration of the method.

Because markdowns are not included in the calculation of the markup percentage used to reduce the retail value of ending inventory to a cost basis, the inventory amount obtained is generally considered to be a lower of cost or market amount rather than cost. In the above illustration, for example, if an ending inventory item costing $6.00 had been originally marked up to a $10.00 retail selling price but subsequently marked down to $8.00, its carrying basis in the ending inventory would be $4.67 ($8.00 retail value less the 41.58% average

[1] Raymond A. Hoffman and Harry Gunders, *Inventories—Control, Costing, and Effect Upon Income and Taxes*, Second Edition (New York: The Ronald Press Company, 1970), Chapters 13-14.

EXHIBIT 8–1

Departmental Inventory Control

11–00 Piece Goods (Department) — Month of: March, 19—

Line		RETAIL Year to date	%	RETAIL Month	%	COST Year to Date	COST Month
1	Beginning inventory and markup %	$ 6,220	40.52	$ 5,000	41.00	$ 3,700	$ 2,950
	Add:						
2	Purchases	$58,795		$31,225		$34,040	$18,722
3	Freight and express	**		**		300	175
4	Additional markups	150		60		**	**
5	Retail adjustments	(45)		—		**	**
6	Total: Purchases and markup %	$58,900	41.70	$31,285	39.60	$34,340	$18,897
7	Total: Inventory plus purchases and markup %	$65,120	41.58	$36,285	39.79	$38,040	$21,847
	Less:						
8	Markdowns	$ 255		$ 105			
9	Employees' discounts	75		30			
10	Other discounts	20		—			
11	Shortages	150		60			
12	Total reductions	$ 500		$ 195			
13		$64,620		$36,090			
14	Less: Sales	$54,620		$26,090			
15	Closing inventory (retail)	$10,000	41.58	$10,000			
16	Closing inventory (cost)					$ 5,842	$ 5,842

departmental markup). If, in the overall store operation, total expenses (buying, selling, promotion, occupancy, and administration) averaged 36% of sales, a subsequent sale of the marked-down item at $8.00 would contribute a profit margin above the amount needed on a store-wide average basis to cover operating expenses. Accordingly, it might be said that the cost basis of the item in the inventory had been reduced to the equivalent of net realizable value less an approximately normal profit margin.

The retail inventory method is frequently adapted to the Lifo cost flow assumption by applying the so-called dollar-value method of determining comparative inventory quantities. The changes in year-end inventory quantities of merchandise are determined by the use of retail price indices which enable comparison of aggregate departmental groupings between years on comparable price-level bases. The inventory basis is built up in layers as in the typical Lifo cost flow compilation. Each current-year cost level in the Lifo compilation is calculated under the retail inventory method after an adjustment (1) to eliminate beginning inventories and (2) to include markdowns in the departmental markup calculations to approximate cost rather than the lower of cost or market.

Departmentalization and broad averaging. Appropriate departmentalization is essential to satisfactory implementation of the retail inventory method. The basic concept is the same as the one underlying the allocation of indirect manufacturing costs—to establish pools combining costs that have similar characteristics in relation to the statistical bases used in allocating them to units of production. In the retail method, the most valid results are obtained if the departmental groupings or other merchandise classifications provide the greatest practicable degree of similarity in merchandise characteristics as to markups, markdowns, and turnover. Without those characteristics, the broad averaging that is inherent in the method could distort the cost/price ratios used to calculate the accounting basis of year-end inventories. Recognition of the concept is demonstrated in some of the method's conventional implementations, such as the treatment accorded merchandise for special sales promotion, adjustments to the retail inventory basis for special purposes such as valuations for local tax assessments, and calculations of inventory in business acquisitions.

The retail inventory method is deeply imbedded in the conventional control and management procedures of the retail industry, particularly department stores. For over thirty-five years, statistics on merchandising results for established departmental classifications and expense

ratios for established functional classifications have been compiled by the Controllers' Congress of the National Retail Merchants Association and by the Harvard Business School. The U.S. Bureau of Labor Statistics issues semiannual price-level indices which are accepted by the Internal Revenue Service as proper for retailers using the Lifo retail inventory method for taxes. All that leads to extensive use of the retail inventory method with little significant diversity of practice in its implementation.

Reconciliation with lower of cost or net realizable value. Several points should be noted from the foregoing description of the retail inventory method which bear on the question of whether it is feasible or necessary to attempt to establish an identical accounting basis of inventories for department store types of operations and, say, manufacturing. Price declines in manufacturing operations are usually unplanned, externally induced events causing dislocation of cost/price relationships that involve relatively longer periods of adjustment and greater uncertainty as to ultimate outcome than those occurring in merchandise operations. The retail inventory method involves cost/price planning processes routinely applied in much greater detail than in the manufacturing operations. Markdowns and markdown cancelations are an integral part of merchandising strategy for increasing turnover and avoiding carryover of seasonal merchandise. Evidence of current retail prices is readily verifiable through observation. The retail inventory method is quite uniformly applied within and among enterprises using the method.

Calculation of net realizable value by those using the retail inventory method—so as to obtain the same lower of cost or net realizable value results as reported by those not using the method—would require certain accounting adjustments that are incompatible with the purposes of the retail method. A major one would be to require specific identification of all marked-down merchandise in inventory. On the contrary, one of the objectives of the retail inventory method is to *avoid* specific identification of items for accounting purposes and to account for merchandise cost flow and inventory costs in units of departments or merchandise classifications.

Further, what useful purpose would be served by requiring adjustment of the method so as to conform its results with results of nonusers? Certainly it could not reduce diversity of practice because practically none appears to exist between users of the retail method. And what would it really add to the validity of comparisons between users and nonusers?

I conclude from the foregoing that it is neither feasible nor necessary to require special adjustment of the results of the retail inventory method to force them to conform with lower of cost or net realizable value results obtained by those not using the method.

I believe this position can be further justified from a conceptual standpoint. The end product in manufacturing operations is the proper basis on which to identify and calculate potential inventory losses for its components since the completed product is the only basis on which a selling price is determined in the ordinary course of business. In short, the costs are determined by components, but the selling price is determined by the end-product category. The quantity units used in arriving at the accounting basis of inventories under the retail inventory method are the aggregate retail values of all the items within each departmental or merchandise classification. The result is quite the opposite of the end-product concept in the manufacturing operation—the cost is determined only for the aggregate unit, but individual selling prices are determined for each component. It is therefore practical to recognize reduced selling prices of the components—as in the retail inventory method—whereas it is not practical to do so for a manufactured product. Each method thus seems to provide a means of determining the lower of cost or net realizable basis for its respective inventory category or the closest practical approximation of it.

On this basis, I conclude that the retail inventory method for department store types of operations represents a reasonably satisfactory method of implementing the concepts basic to the lower of cost or net realizable value principle.

Extractive Industries

Many of the production processes in extractive industries are similar to those of general manufacturing operations. To this extent, the inventory cost concepts and principles recommended in Chapters 5, 6, and 7 should apply equally to inventories of enterprises in extractive industries. The question raised in this chapter is whether the principles need to be expanded or annotated to cover unusual cost elements in the extractive processes such as those relating to prospecting, acquiring, exploring, and developing mineral resources.

Accounting Research Study No. 11. My inquiry into this subject has been confined principally to the material in *Accounting Research Study No. 11*, "Financial Reporting in the Extractive Industries," by Robert E. Field, published by the AICPA in 1969.

ARS 11 does not treat product costs and inventory pricing separately. Its coverage of the subject is relatively complete, however, in discussing basic concepts and accounting principles relating to some of the characteristics that distinguish extractive operations from general manufacturing. The study recognizes basic cause and effect relationships as the concept underlying the determination of costs of activities and products. The need for classifying costs by broad functional activities in establishing cost centers for allocating costs to products is described. That study's general perspective is completely compatible with the approach to general manufacturing costs advocated in this study.

I believe that the principal topic warranting special consideration in this study is the accounting treatment of costs relating to acquisition of mineral reserves prior to beginning the extractive and refining processes. Mr. Field's view on the treatment of those costs in determining product costs for inventory pricing purposes is summarized in the following paragraphs from page 92 of *ARS 11:*

> Whether production or sale is the more appropriate point at which to record amortization of capitalized mining costs depends on whether inventories of minerals produced but not yet sold or transferred to subsequent refining operations are reported as assets. If inventories are reported as assets, then depletion, depreciation, and amortization charges based on the number of units of mineral reserves produced should be recorded as an element of inventory cost.
>
> In most operations, no significant accumulation of extracted minerals occurs at the mine site and separate inventory values are not recorded in financial statements. In other operations, minerals may be extracted and stockpiled deliberately in excess of current sale or current processing demands. If stockpiled inventories are material and realization through sale is probable, they should be recorded in the financial statements and the carrying amount should include a proportionate share of capitalized and deferred mining costs by recording depletion, depreciation, and amortization at the time of production.

I concur with Mr. Field's conclusion that depletion, depreciation, and amortization of capitalized and deferred mining costs should be elements of cost associated with extractive production processes and should be included in determinations of product costs. That point is covered specifically in my recommendations on cost concepts and principles set forth in Chapter 9.

Cost-Recovery-Type Contracting

Cost-recovery-type contracting usually is employed if neither the buyer nor the contractor has sufficient information on a project's ultimate specifications or its production problems to permit a cost estimate reliable enough to negotiate a firm fixed price. In effect, the purchaser assumes the risk and agrees to reimburse the contractor for costs incurred and pay him a fee for his efforts.

The contractor's cost accounting objective, therefore, is to accumulate all costs related to the project—either specifically identified with it or appropriately allocable thereto—in accordance with the terms of the contract. Costs so determined are the basis of the contractor's billings to his customer for cost reimbursement and related fees under the terms of the contract. Under a true cost-reimbursement-type contract, the unbilled accumulated contract costs represent the equivalent of inventory from the standpoint of matching costs and revenue.

Most cost-recovery-type contracting occurs in (1) government procurement for defense and civilian space activities and (2) long-term construction contracts. A limited amount is used in general manufacturing of heavy equipment and experimental projects.

Cost accounting procedures generally applicable to long-term construction contracts do not differ significantly between those having cost-recovery features and those for which the contractor assumes full risk under a firm price. Inventories are not a significant factor in most long-term construction contracting although the essential features of accumulated contract costs have many characteristics of inventories in other types of production. Accounting for long-term construction-type contracts is the specific subject of *ARB 45*. For those reasons the subject has been omitted from this study.

The general cost concepts and principles under consideration in this study do, however, have a close relationship to cost determinations in cost-recovery-type contracting for manufactured products—particularly for an enterprise with both contract and noncontract production. This section therefore explores problems of cost determination and the accounting basis of inventories under general cost-recovery-type contracts and government contracts involving cost/price negotiations.

Cost Problems Under Contract Terms. Cost determinations in all cost-recovery-type contracting production differ from ordinary procedures because the product costs from which the selling prices are computed are a matter of negotiation and contract terms. Cost data

must therefore be accounted for and reported in a manner that enables audit and verification as to conformance with the contract terms, which may or may not conform with the contractor's usual cost accounting practices. Contract cost determinations often require significant realignment of the data produced under the enterprise's ordinary cost accounting procedures. That is necessary to account for custom features of negotiated cost-recovery production and to conform with contract terms regarding allowability of certain elements of cost. Thus, if an enterprise's production includes both cost-recovery-type contract work and ordinary competitive fixed price types of products or services, the cost-recovery contract costs usually need to be accounted for as special purpose cost objectives.

Many contract projects are massive and have highly complex production problems, including long lead times and complex production cycles. The learning curve effect on production costs is frequently significant. If the level of utilization of capacity is a significant factor in contract cost overhead rate determination, it requires negotiation and often becomes part of the contract terms. That is frequently necessary to protect the buyer from increased operating costs if total volume is abnormally low and to protect the seller in the opposite circumstance. Normalization of other cost elements rarely enters into cost-recovery-type contract cost negotiations since the buyer is in effect contracting for payment of all costs that are incurred in the production of the project. Normalization of cost elements other than those related to capacity level becomes a factor only if the contract terms move away from a true cost-reimbursement arrangement and the contractor assumes a greater degree of risk.

As the degree of cost recovery moves toward the negotiated, firm, fixed price type of contract, the special cost objective features of contract cost accounting become less important for inventory purposes, even though they may be required to permit verification and audit of conformance with contract terms. Accounting for a cost-recovery-type contract as a special cost objective is important for two reasons:

1. It provides sound contract cost accumulations from the standpoint of conformance with contract terms by segregating all incurred costs directly or indirectly allocable to the contract during the period of contract production.

2. It enables the removal of total incurred contract costs from the cost flow stream applicable to noncost-recovery production.

The first purpose is self-evident. The importance of the second is sometimes overlooked if substantial amounts of contract and noncontract production are intertwined. It can be important in contract cost allocations but is most important in providing a sound basis for analysis of noncontract production costs. Therefore, the special purpose cost objective concept becomes essential if both contract and noncontract production are present in significant amounts within the same production facilities. The existence of special cost objective requirements does not mean that the cost determination procedures, methods, and records must be completely consistent between projects and different types of production. It does mean that accounting data must be collected in a way that enables the compiling of the special costs.

Government Regulations. Most government procurements are made under terms set forth in "Armed Services Procurement Regulations" (ASPR). The cost principles contained in ASPR, Section XV, have been mandatory in their application to many government negotiated price contracts since 1960, and similar regulations existed many years prior to that date. They set forth definitions and guidelines as to allowability, reasonableness, allocability, and the like. The industry position on those regulations is summarized well by the following:

> The general industry position has been that all reasonable costs incurred, which are allocated to the various contracts in accordance with the contractor's regular system of accounting, should be allowable, provided that the contractor's system of allocation is consistent with generally accepted accounting principles. The cost principles [of Section XV, ASPR] do not accept this criterion. They set forth specific criteria to be used by the government personnel in evaluating the allowability, allocability, and reasonableness of the various kinds and types of costs.
>
> Many contractors spend so much time debating the question of unallowable costs that they fail to take the necessary action to secure reimbursement for the allowable costs. If a contractor intends to do a significant portion of its total business with the government, it is only common sense that it acquaint itself with the rules of the game and take those actions necessary to establish an accounting system designed to maximize the recognition of reimbursement of costs in accordance with the provisions of the cost principles [of Section XV, ASPR].[2]

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[2] R. E. Carroll, "Government Contracting," in *Financial Executive's Handbook*, Richard F. Vancil, Editor (Homewood, Ill.: Dow Jones-Irwin, Inc., 1970), pp. 209-210.

Some government officials have not been entirely satisfied over the years with the cost principles set forth in Section XV of ASPR. A congressional investigation of Department of Defense procurement practices in 1968 brought forth allegations that the government was wasting millions of dollars on negotiated contracts because of a lack of uniform cost accounting standards applicable to such negotiations. The General Accounting Office was ordered to conduct an extensive survey regarding the feasibility of developing uniform cost accounting standards to be applied to all negotiated government contracts. The final report on the survey was issued by the Comptroller General in January 1970.

The digest of the report, which was addressed to the Committee on Banking and Currency of the House of Representatives, is reproduced in Appendix C. Particular attention is directed to the findings that the present ASPR ground rules on cost are ineffective because they (1) frequently refer to generally accepted accounting principles which are not intended to serve contract costing purposes and (2) lack "criteria for use of alternative accounting principles and indirect cost allocation methods." The report concluded, however, that it is impracticable to attempt to develop standards in enough detail to "ensure a uniform application of precisely prescribed methods . . . for each of the different kinds of cost." We should note also the conclusion that contract cost accounting must be maintained in accordance with the standards that are to be developed or must contain data from which cost determinations in accordance with the standards can be readily provided.

Having concluded that it is feasible to develop new standards to provide more uniformity in government contract cost determinations, the government is now developing the machinery for implementation. The Cost Accounting Standards Board was established by the federal government to develop necessary standards and pass on their application in controversies arising over accounting for government contract costs.

Conclusions on Cost-Recovery-Type Contracts. Determinations of cost under cost-recovery-type contracts do not appear to present problems that require particular expansion or exception to the broad operating principles recommended in this study as applicable to product costs used as the accounting basis of inventories in general manufacturing operations. The distinguishing features of cost-recovery-type production are in the negotiated cost/price contractual arrangements and in the administering, monitoring, and settlement procedures. Those features place extraordinary requirements on the development of an

adequate core of cost accounting data and on the refinement of cost accounting procedures to enable the needed special purpose cost analyses of contract production. They illustrate clearly that internal cost accounting must be a rational, analytical, systematic process.

I conclude that cost-recovery-type contract production should be accounted for on a specific identification (project cost) basis. Further, if the contract production is carried on with noncost-recovery-type production, it is essential that the underlying cost procedures be maintained in a manner that permits accumulation of contract costs as special purpose cost objectives so as not to affect appropriate implementation of the basic cost concepts and principles applicable to the noncontract production. It therefore appears necessary to expand this study's recommendations on product cost determinations only to the extent of including comments to recognize special features of accounting for cost-recovery-type contracts.

Use of Market Value for Inventories

Two accepted applications of accounting for inventories depart from the accepted concept of revenue realization and from the lower of cost or market inventory valuation. One is in the accounting for long-term construction contracts—cost is the accepted basis of accumulating inventory amounts but revenue is sometimes recognized before completion of the production process. The subject is covered in *ARB 45*. The second occurs in the exceptional circumstances in which an assured selling price combined with practical difficulties of determining unit costs of interchangeable products gives rise to the acceptance of market valuations of inventories.

This section discusses the use of market value for inventories in certain extractive industries and for certain agricultural products. Authoritative pronouncements on the subject should be updated to state and support the market valuation concept more clearly, to describe the circumstances under which it applies, and to recognize the result of using market valuations if hedging operations are present.

Present Principle. The use of market valuations under certain conditions has been accepted for many years. It is described in Statement 9 of *ARB 43*, Chapter 4, which is quoted in full:

> Only in exceptional cases may inventories properly be stated above cost. For example, precious metals having a fixed monetary value with no substantial cost of marketing may be stated at such monetary value; any other exceptions must be justifiable by inability

to determine appropriate approximate costs, immediate marketability at quoted market price, and the characteristic of unit interchangeability. Where goods are stated above cost this fact should be fully disclosed.

DISCUSSION

It is generally recognized that income accrues only at the time of sale, and that gains may not be anticipated by reflecting assets at their current sales prices. For certain articles, however, exceptions are permissible. Inventories of gold and silver, when there is an effective government-controlled market at a fixed monetary value, are ordinarily reflected at selling prices. A similar treatment is not uncommon for inventories representing agricultural, mineral, and other products, units of which are interchangeable and have an immediate marketability at quoted prices and for which appropriate costs may be difficult to obtain. Where such inventories are stated at sales prices, they should of course be reduced by expenditures to be incurred in disposal, and the use of such basis should be fully disclosed in the financial statements.

We should note particularly in this early statement of the principle:

1. The wording ". . . any other exceptions must be justifiable by inability to determine appropriate approximate costs, immediate marketability at quoted market price, and the characteristic of unit interchangeability."
2. The wording, "Where such inventories are stated at sales prices, they should of course be reduced by expenditures to be incurred in disposal. . . ."
3. The apparent intent to exempt precious metals from the first and possibly second of the conditions otherwise necessary to apply the rule.

APB Statement 4 includes substantively the same provision and describes it as an exception to the realization principle—that is, to the usual convention of recognizing revenue at the time of sale or afterwards. The wording also can be interpreted as excluding certain precious metals from meeting the test of inability to ascertain unit product costs.

Theoretical Basis. Relatively little has been written on the theoretical aspects of particular uses of the market valuation basis, probably because of its limited application. The quotation above clearly designates the use of market as an exception to historical cost principles—market value is a basis to be used only in exceptional situations of the type cited. Since no theoretical basis is set forth in the Bulletin for the

use of market value, the primary justification is assumed to be practicability.

The questions raised in this study have therefore been whether the exception to the cost basis is needed and, if so, whether market value provides a practical solution.

Market Value of Joint Products and By-Products. Many circumstances in which determining appropriate costs is considered impracticable involve joint products or by-products. Joint products are those which by the nature of their production processes cannot be produced separately; both products must be produced to obtain either. If each of the products is a principal factor in an enterprise's production, they are considered to be true joint products. If one is considered the principal product, the others are usually described as by-products. Examples are different minerals extracted from the same ore and the production of petroleum and natural gas from a single well. Meat packing involves the production of both joint products and by-products.

Joint-product and by-product production create some intricate theoretical and practical problems of product cost determinations since all production costs up to the point at which the products become separated are identifiable only with the combined products.[3] Relative market values of the products frequently are used as the common denominator for cost allocations to joint products; the resultant basis of inventory accounting beyond the point of separation is still cost. In certain typical by-product situations, market value is assigned at the point of separation to a by-product which has the characteristics of interchangeability and an assured marketability at prices that cannot be influenced by the producer. Market value becomes the inventory basis for the by-product and is treated at the point of separation as a partial cost recovery to reduce the cost basis of the related principal product for continuing accounting purposes.

The main thrust of cost accounting for joint products and by-products is to obtain reliable unit product cost data on which to base management decisions. I believe the use of market values in the process is nothing more than a practical solution to a difficult problem and should not be viewed as a basis for other market value applications.

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[3] National Association of Accountants [formerly National Association of Cost Accountants], *N.A.C.A. Research Series No. 31,* "Costing Joint Products" (New York: NAA), 1957.

Precious Metals. Mining operations often produce precious metals as joint products or by-products. As noted above, present statements of principle appear to allow the use of market price in valuing inventories of "precious metals having a fixed selling price and insignificant marketing costs," whether or not it is practicable to determine their approximate costs. The apparent preferential treatment may have originally been considered appropriate because metals having fixed monetary values clearly demonstrated the "immediate marketability at quoted market prices and the characteristic of interchangeability" required in the cases in which it is impracticable to determine costs. Further question as to why preferential treatment was originally accorded to precious metals might now be considered academic. Silver no longer has a fixed monetary price, and gold has a fluctuating free market price for nonmonetary purposes. That raises questions as to whether the inventory basis for gold and silver should now be considered the same as for other metals produced as by-products or joint products.

Conclusion on precious metals. I recommend that all mineral production be accounted for under the historical cost principles set forth elsewhere in this study except that the use of market should be permitted for valuing inventories if it is clearly impracticable to determine unit product costs.

Producers and Processors of Agricultural Products Other Than Grains. The research for this study did not cover inventory accounting for agricultural producers—that is, farming of various kinds, ranching, fruit growing, wine making, and the like. Processors of agricultural products, however, have been considered in this study as part of general manufacturing operations. The inventory accounting of processors of agricultural products shows a notable preference for the cost basis of accounting for inventories. The selling price basis seems to be adopted only if determining unit product costs for either internal or external reporting purposes is impracticable. The outstanding illustration is the meat packing industry.

Meat Packers. Cost analysis problems of meat packers are about as complex as can be found in industry. They have long been favorites of textbook writers for illustrating the theories and practices of process costs, transfer costs, and costs of joint products and by-products. Methods of cost allocation differ among companies in the industry principally as a result of the varying emphasis on different

product lines. However, because it is not practicable to determine unit costs of products, dressed fresh meats are often priced in year-end inventories at current selling prices less selling and distribution costs. The basis is generally disclosed in the financial reports of packers. It might be argued that the basis does not meet the test of using prices that cannot be influenced by the producer even though meat products meet the tests of immediate marketability and interchangeability. Packers generally assign market value to all fresh meat sold and apply conventional cost application methods to the remaining balance of the total cost input of animals processed.

Conclusion on Market Value. Inquiry into the problems of cost determinations led to the conclusion that relatively few situations exist in which it is impracticable to approximate product costs on a basis appropriate for inventory accounting. Most of those situations occur in the extractive industries and in the processing of agricultural products. The study was restricted to a limited review of the problems encountered. I accept the use of market value as a rational and practical solution to difficult cost determination problems such as those encountered in the production of joint products and by-products. The present rule appropriately limits the use of market to circumstances of immediate marketability at quoted prices that cannot be influenced by the producer. Accordingly, the retention of the present rule appears to achieve an appropriate matching of costs and revenue and satisfies the accounting objectives of verifiability and neutrality.

Market Valuations and Hedging Procedures

Grain merchandisers and certain types of grain processors constitute another agricultural industry group that uses market value as a primary element of accounting for inventories. Interrelationships between merchandising and hedging operations, however, present unique features that warrant separate consideration.

I have collaborated in studying this area of inventory accounting with C. Stevenson Rowley, Jr., who undertook research on the subject in the fall of 1969 for his doctoral program at the University of Wisconsin.[4] Mr. Rowley's inquiry included discussions with financial

[4] "Inventory Pricing in the Grain Industry: A Study of Current Practice" (Ph.D. dissertation, University of Wisconsin, 1970). The dissertation is available at the libraries of business schools at the University of Wisconsin (Madison) and Arizona State University (Tempe), and in libraries of the AICPA, grain companies, and accounting firms participating in the study.

executives of twenty-six companies in the industry, usually in conjunction with representatives of their respective accounting firms. The following comments on the subject are based principally on Mr. Rowley's findings.

The accounting basis of inventories in the industry can be classified in terms of four general types of operations: (1) grain merchandisers or traders, (2) flour millers, (3) wet-corn processors and cereal manufacturers, and (4) soybean processors and feed millers. The use of the market basis is closely correlated with the extent to which a company hedges its purchase and sales positions by trading in futures contracts in the commodities markets. Many grain merchandisers and flour millers have a policy of hedging substantial portions of their purchase and sales transactions. Under those circumstances, their trading in futures contracts becomes an integral part of their cost determination processes.

Grain Merchandisers. In the perfect hedge situation, the grain merchandiser is protected from losses (and eliminates potential holding profits) on commodity inventories, enabling him to calculate his trading margin on each transaction. The extensive use of hedging by grain merchandisers has given rise to a method of inventory pricing that is appropriately described in the Rowley study as the hedging procedures method. It not only involves the pricing of the physical inventories of grains at market but also combines with that basis the adjustment of unrealized profits and losses on open purchase and sales contracts at the inventory date. If used with perfect hedging, the method eliminates all speculative profits or losses from the operating results reported for the period, and the outcome is a basis that approximates the Fifo cost basis of inventory.

The use of market in pricing inventories of the grain merchandiser is certainly compatible with the basic market valuation principle from the standpoint of dealing with a product having immediate marketability and unit interchangeability. Further, the practice of blending grains by many merchandisers creates difficulties in assigning cost of units in the inventory, although that feature is not insurmountable. However, a merchandiser that hedges substantially all its purchase and sales positions would not achieve an appropriate matching of costs and revenue if it priced its year-end inventory at market and failed to take into account the market status of its open futures contracts. The hedging procedures method of inventory used commonly by grain merchandisers appears to have developed as a practical solution to the problem. Grain merchandisers operate in an environment that is

highly oriented toward future market expectations. The method used provides them with a logical basis for analysis of daily trading activities —both as to past performance and for planning future merchandising operations. It also provides an approximation of the conventional Fifo cost basis for the hedged portion of the inventory which, because of its protection against market price declines, results in a basis of cost that is not in excess of net realizable value.

Flour Millers. Wheat constitutes a large portion of flour cost, and flour is commonly sold in large quantities for forward delivery (as much as 120 days). Many flour millers therefore practice hedging in a manner similar to that followed by grain merchandisers. Likewise, the hedging procedures method is used by many flour millers. Inventories of grain and grain content of flour are priced at market, adjusted for unrealized gains and losses on futures contracts for purchase or sale of grain. Mr. Rowley pointed out, however, that the method is used principally if the enterprise is substantially hedged; if significant amounts of unhedged inventories exist, the practice is generally to value them on a lower of cost or market basis. Mr. Rowley also pointed to some inconsistency among companies in the pricing of the mill feed by-product inventories of flour milling. Some millers adjust that element to market and others do not. Preferable practice is not to adjust the mill feed to market since it is not protected by hedges. Therefore, to adjust mill feed to market could result in failure to approximate the lower of cost or market for flour inventories because mill feed prices are frequently subject to wide-ranging fluctuations.

Wet-Corn Millers and Cereal Manufacturers. Manufacturers of starch and corn sugar (wet-corn millers) and cereal manufacturers do not hedge to the same extent that grain merchandisers and flour millers do because the movements of selling prices of their products do not normally parallel closely the price movements of grain futures contracts. Activities of companies in the grain futures markets could be considered hedging only in the broad sense of representing occasional protective measures in general grain purchasing functions. Processors of that type, however, generally consider that they obtain better income determinations from using the conventional cost basis of inventory than from adopting the market basis.

Soybean Processors. Processors of soybeans present some interesting possibilities for the application of the hedging procedures basis as well as illustrations of a diversity of accounting practices within an industry. Futures markets exist for soybeans and soybean oil and meal,

which are the two basic merchantable products derived from crushing the beans. That presents a processor some eighteen possible combinations of positions with respect to his inventories and futures contracts for hedging. Producers in the field either have other grain operations or have generated the soybean operations from other grain activities that had, or did not have, traditional hedging procedures. Those two factors of the soybean industry have probably accounted for the apparent wide diversity of inventory methods in the industry. Another factor making it difficult to distill a common practice is that the industry is relatively new, having developed rapidly since the early 1950s.

Feed Millers. Feed production is an adjunct of other grain processing activities; few companies are solely engaged in that manufacturing activity. There are no specific futures markets in feed. Many factors other than price of grain content govern the market price of feeds. Accordingly, there is no significant amount of hedging in feed inventories, nor is there a particular reason why the manufacturers of feed should not be able to determine appropriate cost bases for inventory purposes.

Conclusion on Hedging Procedures. Study of inventory accounting of grain merchandisers and processors presents an interesting illustration of how certain accounting principles have developed. The present rule has permitted the enterprises to use market value as an exception to historical cost principles because it is considered impracticable to determine unit costs of certain products. The development of the hedging procedures method indicates management's preference for an approximate cost basis even under complex circumstances. The need for management cost accounting procedures that provide logical data on which to base cost/price planning and to monitor operating results effectively has resulted in tacit acceptance of a new inventory accounting principle for companies that hedge commodity prices significantly.

I therefore recommend that the hedging procedures method be given authoritative recognition as the preferable accounting basis of the hedged portions of inventories of grain merchandisers and processors. The method should be differentiated from methods that are exceptions to the realization principle. The use of the method should, however, be appropriately explained in notes to the financial statements, with disclosure of the extent to which the resulting basis approximates the lower of cost or net realizable value. The recommendations are incorporated in the substance of recommendations set forth in Chapter 9.

9

Recommended Restatement of Principles

Considerations and Conclusions Underlying Recommendations

The main thrust of my research was directed toward a critical examination of the concepts and principles underlying existing inventory accounting practices as well as to their application in practice. The hypothesis underlying the examination was that existing inventory accounting practices may give rise to diversities in reported operating results and financial position even if the underlying circumstances are essentially similar. The overriding purpose of the examination was to determine if significant diversities do exist and, if so, whether they might be narrowed through revision of existing principles or establishment of criteria for their implementation.

I found that inventory accounting practices do permit significant differences in financial reporting in essentially similar circumstances. That is evident in critical writings on the subject by users of financial information and confirmed by interviews with financial executives in industry and top technical partners of accounting firms.

Diversities appear in three general areas in determining the accounting basis of inventories. First, the most difficult problem to deal with is found in the cost concepts and principles underlying inventories of manufacturing and other types of production operations. The diversities revolve around which costs are to be associated with production operations, which costs are to be used to calculate unit product costs for inventory purposes, which costs are to be treated as period costs of the periods in which they are incurred, and how product costs are to be assigned to units of product. A second practice of considerable

diversity lies in implementing the present lower of cost or market rule; difficulties particularly surround the term *market*. Finally, presently accepted principles governing the selection of cost flow assumption—Fifo as compared with Lifo, for example—permit substantial differences in inventory totals to be reported in circumstances that are substantively similar.

Emphasis throughout this study has been on determination of a cost basis of items on hand in year-end inventories which represents the portion of current year's costs that should be charged against future revenue expected to be realized from the ultimate disposition of the items. If an enterprise has inventories, an appropriate matching of future costs and revenue in its income statements is inherently dependent on an appropriate accounting basis for inventories reflected in balance sheets. Consequently, I believe there should be no difference in emphasis for proper inventory accounting as between income statements and balance sheets.

Although the research for this study was conducted within the framework of historical cost accounting, many of the problems studied were also viewed in the light of possible solutions that might result from moving from that basis to so-called current cost or current value accounting. Little support for a move was found among either the users or the producers of financial statements who participated in the study. The consensus was that much can be done to narrow diversities of practice within the present framework. Discussions also brought out clearly that the historical cost basis will continue to be used under any circumstances to produce the information on which management plans, controls, and monitors the results of its operations; historical cost is the basis from which current value projections would be made if they were to be required at some future date for reporting income.

Many diversities in practice can be narrowed or eliminated by expanding authoritative pronouncements to include important concepts and broad operating principles such as those discussed in the previous chapters. The following should be included:

1. Adoption of a positive statement favoring absorption costing with specific recognition of established principles of cost composition such as those underlying the identification of direct material and direct labor costs if practicable, normalization of cost elements, and calculation of overhead rates at levels of production that eliminate idle excess capacity costs from overhead allocations.

2. Description of circumstances in which specific identification of inventory costs is preferable to an assumption of cost flow. Expression of preference for the first-in first-out cost flow if an assumption of cost flow is necessary and a statement of requirements for additional disclosure if other cost flow assumptions are used.
3. Adoption of the rule of lower of cost or net realizable value.

The adoption of those principles should assist in reducing diversities in practice. At the same time, one must recognize that no neat package of principles or other criteria exists to substitute for the professional judgment of the responsible accountant. The need for the exercise of judgment in accounting for inventories is so great that I recommend to authoritative bodies that they refrain from establishing rules that, in isolation from the conditions and circumstances that may exist in practice, attempt to determine the accounting treatment to be applied under any and all circumstances.

Recommended Revision of *ARB 43*, Chapter 4

Discussions in earlier chapters point out my acceptance of much of the substance of *ARB 43*, Chapter 4, which represents the present accepted pronouncement on the accounting basis of inventories. Accordingly, my summary of findings and recommendations is presented in the format of a suggested revision of that document. The supporting statements of problems and reasoning in the first eight chapters of this study must be examined to judge the conclusions and recommendations incorporated in the following revision.

THE ACCOUNTING BASIS OF INVENTORIES

Introduction

If the operation of a business enterprise includes the ownership of a stock of goods, adequate financial accounting requires that inventories be properly compiled and recorded periodically. Inventories are necessary to establish the financial position of an enterprise and to measure its periodic income.

The term inventory is used to designate the aggregate of those items of tangible personal property of an enterprise that (1) are

held for sale in the ordinary course of business, (2) are in the process of production for sale, or (3) are to be consumed currently in the production of goods or services to be available for sale. Thus, the term embraces the goods awaiting sale in a merchandising enterprise and the finished products of a manufacturing enterprise. It includes products in process of production (work in process) in a manufacturing enterprise and raw materials and supplies that are to be consumed directly or indirectly in production. The term is used sometimes to describe operating materials and supplies of certain types of enterprises such as utilities and oil producers.

This statement deals with the broad accounting principles underlying the pricing or determination of the accounting basis of inventories of enterprises engaged in merchandising operations and in manufacturing and other types of operations involving production. Its conclusions are not directed to, or necessarily applicable to, noncommercial businesses or regulated utilities.

Conceptual nature of inventories

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A major objective of accounting for inventories is the proper determination of income through the process of matching costs against revenue. Normally, revenue arises in a continuous repetitive process or cycle of operations in which goods are acquired and sold or raw materials are purchased, processed, and the resulting products are sold; as goods or products are sold, other goods and products are acquired for additional sale or processing. The input into the accounting for this process is a continuing flow of costs incurred for merchandise purchased or for the materials, labor, and indirect costs of producing manufactured products. Appropriate matching of the costs with the revenue from the sales of the merchandise and products manufactured is interrelated with asset valuation since it involves the division of costs associated with an accounting period between

> those that have expired and become expenses of the period
>
> *and*
>
> those that are related to future periods and are carried forward as assets at the end of the period.

The aggregate balance of costs to be carried forward at a given

date should represent costs that are appropriately assignable to the remaining physical quantities of materials or goods on hand to be consumed in production or to be sold in future periods.

Conceptually, if an asset is sold, its acquisition cost expires and becomes an expense chargeable against the revenue produced by the sale. The aggregate cost basis of an ending inventory therefore theoretically could be determined by deducting the cost of all units sold and otherwise disposed of from the total cost of all merchandise acquired and manufactured during a period. A greater degree of validity for balance sheet and income determination purposes is obtained by pricing the physical quantities of units on hand at the year end at their respective unit costs or the closest practical approximations of the costs. The cost of units sold during a period is approximated for interim financial reporting and the more accurate physical inventory basis determined at, or reasonably near, the close of the fiscal year.

The amount conventionally shown in income statements as cost of goods sold matched against the year's revenue from sales is a composite of costs carried forward as the preceding year's ending inventory plus costs of merchandise acquired or products manufactured during the year reduced by the cost basis of the units on hand at the year end.

The entire process inherently requires the association of purchase costs and manufacturing costs with units of merchandise and manufactured products.

Cost basis of inventories

The primary basis of accounting for inventories is cost, which has been defined generally as the price paid or consideration given to acquire an asset. In principle, cost of inventories is the sum of the applicable expenditures and charges directly or indirectly incurred to bring an article to its existing condition and location. Except as otherwise provided for in this statement, inventories should be stated at cost in conformity with the historical cost basis of initially recording assets at acquisition cost and excluding increases in value of assets from income until corroborated by an exchange transaction. Thus, determination of the acquisition cost of the items comprising an inventory is ordinarily the initial step in establishing the accounting basis of the inventory.

Merchandise cost

The cost basis of goods acquired for sale in merchandising operations should be the purchase price plus costs of inbound transportation. That basis is conventionally considered to be the cost of bringing merchandise to the location and condition in which it is available for sale. None of the indirect costs of buying, storing, and handling merchandise are considered allocable to the cost of goods in merchandising operations because all of those functions are conventionally considered to be carried on in support of the selling functions.

Costs of manufacturing products

Inventories of manufacturing enterprises may consist of raw materials and supplies to be consumed in production, partly finished components of end products in various stages of completion, and finished products and components held for sale. An enterprise's operations may encompass numerous types of facilities for fabricating and processing the different products manufactured for sale.

Two types of problems involved in determining product costs for inventories in manufacturing operations are

(1) *cost selection*—identifying the broad classifications of costs associated with the manufacturing operations of the production period that should be ascribable to products and

(2) *cost assignment*—tracing those costs to products, either directly or indirectly, through rational and systematic means of measuring both (a) the relative extent to which the various manufacturing processes cause the costs to be incurred and (b) the relative extent to which the various products use the processes.

Cause and effect relationships underlie the concepts and principles governing the determination of costs of manufacturing products.

Manufacturing costs. Manufacturing costs are those operating costs that are necessary to the manufacturing activities by

reason of their predominant functional origin or control. Ordinarily, manufacturing costs are costs that would not be incurred if the enterprise did not maintain the facilities and organization to carry on manufacturing activities regularly. Manufacturing activities in that sense are the processes, functions, and overall operations involved in combining materials and services to produce products for sale to customers. They do not include the activities predominantly associated with the enterprise's general research and development or with its selling, general and administrative, and financing functions.

The development of a rational, systematic process of determining costs of manufacturing products ordinarily requires the accumulation of operating cost data classified in terms of the major functions involved in the manufacturing processes.

In determining unit product costs for inventory purposes, all elements of cost associated with the manufacturing activities of an enterprise are relevant to unit product costs except to the extent that they represent (1) costs of idle excess production capacities or (2) costs which are so abnormal as to represent losses rather than costs of producing. Costs in those two categories are considered to have expired and are thus chargeable to expenses of the period in which they are incurred.

Direct costs. In many manufacturing operations it is practicable to identify, physically and by observation, specific units of material as integral parts of the end products and to identify by observation the application of labor to specific units of product. That identification is fundamental to rational, analytic calculations of product costs because of its reliable cost association and measurement. If justified by the facts, therefore, the costs of material and labor should be accounted for as identifiable components of unit product costs.

In accounting for production in continuous process operations, identification of direct material and direct labor may not be feasible because measurement of units of labor or material added in the process is not practicable. Illustrations are certain types of refining of metals, petroleum, and chemicals and plating and heat-treating operations in general manufacturing.

Normalization of cost factors. Accounting for losses from production cost abnormalities as expenses of the period of in-

currence is ordinarily achieved by normalization of cost factors entering into the calculations of unit product costs. Normal usage and performance with respect to quantities of direct material and direct labor are set at levels conforming with standards of achievement that are considered reasonably attainable under ordinary operating conditions existing during the production period involved. Unless idle excess capacities are present, the same concept of normalcy applies to methods of measuring production activities for overhead allocations.

Normal direct material prices are those prevailing during the accounting period for purchase of normal lot size quantities from regular sources of supply. Normal direct labor costs are generally those compiled on the basis of the hours required at reasonably attainable levels of production efficiency priced at average hourly rates for the skills ordinarily required for the various operations. Normal overhead rates are those calculated on the basis of providing for appropriate allocations of all manufacturing costs incurred in connection with the ordinary operating conditions existing during the period. Overhead rates should include normal amounts of waste and spoilage that are not otherwise included in the direct material and direct labor cost factors used in unit product cost calculations.

Idle facility costs are usually segregated from the cost data underlying unit product cost assignments and specifically identified as expense of the periods in which incurred. Costs of other types of excess productive capacities are usually identified and segregated through appropriate structuring of overhead rates.

Manufacturing overhead allocations. Manufacturing costs exclusive of those assigned to units of product as direct costs represent indirect or overhead costs. The basic objective in allocating overhead costs to units of product is to develop a rational, analytical system of assigning the total pool of those costs to products on bases that generally measure the extent to which the various products use or consume the enterprise's manufacturing resources and facilities. Underlying the validity of all allocation methods is the concept of accumulating pools of costs having similar characteristics as to their functional origin or control, thereby enabling the selection of appropriately related statistical measurements of production through which to trace the indirect costs to products.

Overhead rates. Manufacturing overhead rates used in the calculation of unit product costs are generally developed on a predetermined basis to reflect (1) reasonable averages of short-range or cyclical variations in those elements of cost that vary directly in relation to production volume (variable costs) and (2) relationships between those elements of cost that do not vary with volume (fixed costs) and the levels of utilization to which production capacities are committed for the accounting period (usually the fiscal year). Operations for a fiscal year are normally planned at an overall activity level that allows for limited expansion or contraction necessary to accommodate short-term cyclical or seasonal demands. The normal expectancy levels so determined should be based on ordinarily scheduled work periods with appropriate allowances for employee rest periods, holidays, vacations, work stoppages for inventory-taking, and the like. If operations are planned in that manner from year to year and the planned levels of utilization do not involve major expansion or contraction of available productive capacities, those normal expectancy levels represent appropriate utilization levels for calculating both variable and fixed elements in overhead rates.

Excess capacity costs. If the expected level of capacity utilization falls significantly below normal expectations, the overhead rate should provide for the absorption of fixed manufacturing overhead at a level of utilization considered to be reasonably attainable under the planned normal operating conditions for which productive capacities have been provided. Then, the unabsorbed fixed overhead provides a means of identifying the amount of costs attributable to unused excess capacities that should be accounted for as expense of the period in which it is incurred.

The need for segregating costs of unused capacity in that manner occurs most frequently (1) if new facilities are added that have greater capacities than are immediately needed, (2) if operations are being phased out in anticipation of discontinuing certain product lines, or (3) if productive facilities are in the process of being abandoned or converted to new uses. The allocation of fixed overhead costs in those situations at rates based on expected levels of capacity utilization could produce abnormally high unit product costs by reason of including excess capacity expenses. The fixed cost element of the overhead rate in those circumstances should be based on the higher level of activity

reasonably attainable on a full-stream basis or at the level considered normal prior to the phase-out period.

Goal—to reflect causal relationships. Numerous combinations of methods and procedures can be employed in developing analytical systems for determining costs of manufacturing products. No one method is superior and it is impracticable in a general statement of this kind to develop criteria for determining costs in specific types of manufacturing operations. The governing principles are grounded in cause and effect relationships. The highest degree of validity in cost assignment to products is found in that assignment that best reflects the most likely causal relationship, for example, as is evident in direct costs. The criteria for measuring the validity and effectiveness of indirect cost assignment lie in the extent to which the methods employed develop homogeneity in relationships between types of cost and the statistical measurements of production activity used to trace costs to points at which they can be identified with specific products.

148 Cost flow assumptions

It is practicable in a few types of operations to identify specific acquisition costs of merchandise or specific costs incurred in manufacturing products with the units sold during the period and those on hand at the end of the period. Specific identification is not practicable in most manufacturing and merchandising operations if interchangeable units of products and merchandise are manufactured or purchased at differing unit costs in a continuing flow of transactions. Some assumption of the flow of units and related costs is therefore necessary to assign appropriate acquisition costs (1) to the units sold during an accounting period and (2) to units remaining on hand in inventory at the end of the period.

Specific identification. Specific identification of costs is practicable and desirable only if the inventory items are not interchangeable and are acquired or produced as units that are identifiable throughout the production and merchandising processes. Specific cost identification is most commonly used in merchandising (by either the manufacturers or the distributors) of heavy industrial equipment, farm equipment, automobiles and

trucks, art objects, antiques, expensive jewelry, and the like. The distinguishing characteristics of those inventories are that they are ordinarily comprised of large or relatively expensive units, purchased or produced as individual units or in small quantities, and units are not interchangeable. Averaging of unit costs or assumptions of cost flow for those types of items might produce an unrealistic basis for the inventories and fail to achieve a logical matching of costs and revenue.

First-in first-out—Fifo. The most likely physical flow of purchased materials through a merchandising or manufacturing company is that the earliest units acquired are the first processed and sold. Most products and merchandise deteriorate over time and most manufacturers and merchants try to sell their oldest stock first. Intuitively, we assume that costs attach to physical units and follow the same flow. Therefore, if specific identification of unit costs is impracticable and unless persuasive evidence leads to a contrary conclusion, the most realistic approximation of specific identification is achieved through assuming a first-in first-out flow of units and related costs.

Base stock assumption. A variation of the Fifo cost flow termed the base stock method assumes that an absolute minimum quantity of inventory can be identified in some types of operations as necessary to maintain a continuing operation and therefore represents an involuntary fixed commitment analogous to a fixed asset. An arbitrary cost basis is assigned to the base stock and carried forward unchanged to avoid affecting income with fluctuations which might result if the first-in first-out method were applied. Decreases in the base stock quantities at the end of a period are considered temporary conditions, and reserves are provided for an anticipated excess of replacement cost over the arbitrary cost basis which would otherwise be applied. The method is not used often in practice because it is not allowable presently for calculating income for federal income tax purposes.

Last-in first-out—Lifo. Lifo involves an artificial assumption of cost flow that matches the revenue from the sale of a particular unit with the cost of an entirely different unit. Year-end inventory quantities equal to those on hand at the beginning of the year are priced at the beginning-of-the-year cost basis. Inventories

are priced on a basis reflecting the current year costs only to the extent that year-end quantities exceed those at the beginning of the year. The effect on income is to match the latest incurred production or merchandise costs with the current year's sales revenue. The effect on assets is that a Lifo cost flow assumption may price a substantial portion of year-end inventory quantities at costs in effect during the year in which a particular enterprise originally adopted the method. If there have been significant quantity fluctuations since the year the method was adopted, portions of the year-end inventory quantities may be priced at costs in effect in any of the various years since adoption of the method.

Lifo was originally adopted as a substitute for the base stock method and is allowable for federal income tax purposes provided the enterprise also uses the method for general financial reporting.

Problems of using various cost flow concepts. The accounting objective of matching appropriate costs with revenue is achieved ordinarily by identification of the specific costs of items sold or the closest practical approximation of the costs. If operations involve a continuing flow of interchangeable items having differing unit costs, the closest approximation to specific identification is a first-in first-out assumption of cost flow. Specific identification and Fifo therefore most clearly approximate the intuitive expectation of a user of financial statements that income has been determined by comparing sales revenue with the costs of the items sold and that the balance sheet inventory amounts represent the acquisition costs of the units remaining on hand.

Recognition must be accorded to the soundness of the base stock concept of inventory in certain special circumstances. The fact must be recognized (1) that many enterprises enjoy substantial tax benefits from using Lifo and will continue to use it, whatever the actual flow of product, and (2) that this creates differing accounting results in substantively similar circumstances, thereby failing to meet the qualitative objective of comparability in financial reporting.

The wide range of differing circumstances in specific cases and the importance of its tax benefits make it impracticable to establish criteria that would place restrictions on the use of Lifo.

Disclosure of the effects of artificial cost flow assumptions. Knowledge of the cost flow assumption underlying the accounting

basis of inventories is essential to an understanding of the financial statements of an enterprise in which inventories are a material factor. Specific identification of cost and the first-in first-out assumption of cost flow are accepted in principle as representing a realistic, practical, and expected matching of costs and revenue if inventories are a factor. If, however, the last-in first-out, base stock, or any other assumption of cost flow is used, supplementary information should be submitted to disclose the effect of its use as compared with the first-in first-out basis on (1) net income of the period and (2) the inventory amounts in the balance sheet, with appropriate disclosure of the tax allocations necessary to determine the effects.

The essential element of disclosure about the accounting basis of inventories is the extent to which acquisition cost or the closest practical approximation of it has been used in determining the cost of items sold and on hand in inventory. Disclosure of the methods of calculating unit costs is relevant only to the extent it discloses how the method produces an effect differing from the normal expectation. For example, unit product cost standards (standard costs) are used extensively in determining costs of manufactured products. If those specification-type costs are adjusted periodically to reflect current cost experience, they provide an appropriate basis of determining the cost basis of inventories under either Fifo or Lifo cost flow assumptions. The same is true of using average costs in calculating unit costs or cost elements. Use of the terms standard or average costs without further explanation does not, however, provide cost flow information necessary to an adequate understanding of the cost basis of inventories.

Recognition of loss in utility value of inventories

Lower of cost or net realizable value. A departure from the cost basis of pricing inventories is required if the utility value of inventory items is no longer as great as its cost. If there is evidence that the utility value of inventory items in their disposal or use in the ordinary course of business will be less than cost, the difference should be recognized as a loss of the period in which it becomes evident. That should be accomplished by reducing the cost basis of the affected inventory items to their net realizable value. For purposes of applying the principle, net realizable value

means anticipated selling price less (1) costs of completion and (2) appropriate allocations of the marketing, administration and general costs (commercial expenses) attributable to sale of the items in question. The implementation of the principle of lower of cost or net realizable value should not serve to increase the margin between the expected selling price and the reduced cost basis of the affected items beyond that existing immediately prior to the discovery of the factors that give rise to the revaluation of the inventory amounts.

Loss in the utility of inventory items may arise through physical deterioration, obsolescence, unbalanced inventory position as between materials and end product components, or excess stocks in relation to consumer demands. The existence of potential losses may be detected through external reductions in either acquisition prices of input costs or in selling prices of end products, or through situations developing in which selling prices may not be increased to cover increases in acquisition costs. Any of those conditions may dislocate existing or planned cost/price relationships and profit potentials. While the events indicate potential losses in utility, the earliest point at which losses can be measured objectively is the date that the enterprise's management adopts or commits itself to a planned course of action relative to the use or disposal of the products affected. Only then can the resultant planned net realizable values be determined.

The profit-making potential of inventory items measures their utility value. A continuing process of planning profit potentials, formally or informally, requires projecting cost/price relationships to determine the extent to which sales prices will provide margins above costs to (1) cover the direct selling expenses and allocable portions of general selling and administrative expenses and (2) yield overall profits. The same projection process should be utilized in measuring losses in inventory utility if it is expected that the affected items will be sold in the ordinary course of the enterprise's merchandising operations. In those circumstances, the anticipated selling price less allocable commercial expenses of the period in which the items are to be sold provides a maximum basis at which the items should be carried in the inventory. If the affected inventory items are not to be sold in the ordinary course of merchandising operations, net realizable values should be the anticipated selling prices less direct expense of disposal. The implementation of the lower of cost or net realizable value

principle essentially provides for a break-even basis on disposition of the affected items unless the realignment would increase the carrying basis of the items.

In general, implementation of the principle should not operate to offset losses in some inventory items against potential profit margins in other items or portions of the inventory. The conventional application of the retail inventory method is recognized as an appropriate implementation of the principle on a departmental basis since the department is recognized as the basic unit for department store type merchandising operations.

Losses on firm purchase commitments. Accrued losses on firm purchase commitments for materials and services should be calculated in the same manner as losses in utility value of inventory items and should, if material, be recorded as expenses of the period in which they become evident.

Special areas

The foregoing discussions cover principles underlying cost determinations, cost flow assumptions, and recognition of loss in utility value of inventories that apply to a wide range of merchandising, manufacturing, and other types of operations. Certain types of merchandising and production operations, however, have features that create unusual inventory accounting problems. Several types of problems are outlined in this section to highlight the extent to which the areas may or may not require special treatment in establishing the accounting basis of inventories.

The retail inventory method. In department store type operations, specific identification of merchandise costs becomes impracticable because of large volumes of merchandise sold in small quantities at varying rates of turnover. A practical solution to problems of matching costs and revenue in that type of operations, known as the retail inventory method, has been used extensively for many years by department stores and in a few other types of operations having similar merchandising characteristics.

The method consists essentially of the accumulation of the retail selling value of all items entering into the departmental merchandising operations in a manner that enables a reduction of the retail amounts of sales output and remaining inventories to a cost

basis through the application of average departmental gross markup percentages. The retail value of the input (beginning inventory plus the period's purchases) for each department or merchandise classification is reduced by sales—thereby arriving at an amount representing the retail value of the ending inventory. That amount is reduced to a cost basis by applying the average gross markup developed statistically for the input of the department or merchandise classification. The retail values so calculated for inventories are adjusted periodically to conform with retail values of physical inventories of merchandise on hand.

The method is adaptable to the Lifo cost flow assumption through the application of the so-called dollar-value method of determining the required departmental inventory quantity comparisons at beginning and end of each year. A Fifo application of the retail inventory method approximates a lower of cost or net realizable basis of inventories by eliminating markdowns in selling prices from the calculations of the markup percentages used to reduce the retail values of ending inventories.

The retail inventory method depends on appropriate departmentalization. The concept is much the same as that underlying the allocation of indirect manufacturing costs, namely, establishing pools of costs having similar characteristics in relation to the statistical bases used in allocating them to units of production. The most valid results are obtained under the retail method if the departmental groupings provide the greatest practicable degree of similarity in merchandise characteristics as to markups, markdowns, and turnover. Without those characteristics, the broad averaging that is inherent in the method could produce distortions of the cost/price ratios used to calculate the accounting basis of year-end inventories.

The use of the retail inventory method for department store type operations and other merchandising operations having similar characteristics is accepted as a satisfactory means of implementing the basic concepts and principles outlined in this opinion.

Extractive industries. The concepts and principles outlined earlier in the discussion as applicable to the accounting basis of inventories for manufacturing enterprises are equally applicable to the production processes of extractive industries. Extractive processes involve certain additional cost elements such as depletion and the depreciation and amortization of deferred mining

costs. Production costs and inventories should include those cost elements.

Cost-recovery-type contracts. Under a true cost-reimbursement contract, unbilled accumulated costs determined in accordance with contract terms generally represent an acceptable basis for inventory accounting purposes. The feature that distinguishes cost determinations in all cost-recovery-type contract production from ordinary cost procedures is that product costs from which the contract price is computed become a matter of negotiation. The purchaser is in effect assuming the risks and merely employing the contractor's organization and production facilities. The purchaser agrees to reimburse the contractor for costs incurred in performing the service and to pay him a fee for his efforts. The contractor's cost accounting objective, therefore, is to accumulate all costs related to the project, either specifically identified with it or appropriately allocable to it, in accordance with the terms of the contract. Cost accumulations would ordinarily be made on a specific identification basis, by project, without eliminating abnormalities, and overhead might be allocated in accordance with the negotiated terms of the contract rather than the contractor's usual allocation basis.

In other respects, the cost concepts and principles outlined for determining the cost basis of inventories would apply equally to this type of production.

Joint product and by-product costs. It is frequently considered impracticable to implement accepted cost concepts and principles applicable to general production accounting in situations involving joint products or by-products. Joint products are those that by their nature or by reason of their production processes, cannot be produced separately. If each of the products is a principal factor in an enterprise's production, they are considered to be joint products. If one is considered the principal product, the others are usually described as by-products. Examples are combinations of minerals in the same ore and the combination of petroleum and natural gas in the same well. Meat packing involves production of both joint products and by-products.

Joint product and by-product production creates some intricate problems in cost determination because all production costs are identifiable only in total up to the point that the products can be

separated. Relative market values of the products are frequently used as a basis for joint cost allocations between the products. The resultant basis of inventory accounting beyond the point of separation then follows accepted cost concepts and principles. In some typical by-product situations, a market value basis is assigned to the by-product, leaving the total of the residual cost as cost of the principal product.

Market as the accounting basis of inventories. Exceptional cases exist in which it is not practicable to determine an appropriate cost basis for products. A market basis is acceptable if the products (1) have immediate marketability at quoted market prices that cannot be influenced by the producer, (2) have characteristics of unit interchangeability, and (3) have relatively insignificant costs of disposal. The accounting basis of those kinds of inventories should be their realizable value, calculated on the basis of quoted market prices less estimated direct costs of disposal. Examples are precious metals produced as joint products or by-products of extractive processes and fresh dressed meats produced in meat packing operations.

Hedging procedures. If an enterprise is engaged in the merchandising or processing of grains and follows a policy of hedging its inventory positions by entering into contracts in established commodity futures markets to buy or sell corresponding quantities of grain or grain content of converted product, the preferable accounting basis for its grain inventories is current market price adjusted to reflect gains and losses of all open commodity futures contracts at the inventory date. The use of this so-called hedging procedures method operates to approximate a lower of cost or net realizable value basis for the hedged inventory amounts.

Disclosures

The selection and methods of implementing the accounting principles underlying an enterprise's accounting basis of inventories constitute an accounting policy required to be disclosed in accordance with *APB Opinion* 22, "Disclosure of Accounting Policies." Disclosure necessary to an understanding of the accounting significance of the inventory basis ordinarily should include the following:

1. The basis of identifying cost with merchandise or products, such as specific cost identification of units, Fifo or Lifo cost flow assumption, or combinations thereof.
2. The effect of using Lifo, base stock, or any cost flow assumption other than Fifo, as compared with the Fifo basis, on (a) net income of the period and (b) the inventory amounts in the balance sheet. (The effect should include the tax allocation necessary to determine the effect.)
3. The extent to which the basis reflects a valuation of lower of cost or net realizable value. If a material portion of the inventory has been reduced to reflect loss in utility value, the amount of inventory and the extent of loss recognized in the write-down should be disclosed. The extent to which and reasons why the accounting basis of inventories is not on a cost basis except for reductions to realizable values.

A significant change in the basis of accounting for inventories represents an accounting change required to be disclosed in accordance with *APB Opinion* 20, "Accounting Changes."

APPENDIX A

Accounting Research Bulletin No. 43

CHAPTER 4, "INVENTORY PRICING"

1. WHENEVER THE OPERATION of a business includes the ownership of a stock of goods, it is necessary for adequate financial accounting purposes that inventories be properly compiled periodically and recorded in the accounts.[1] Such inventories are required both for the statement of financial position and for the periodic measurement of income.

2. This chapter sets forth the general principles applicable to the pricing of inventories of mercantile and manufacturing enterprises. Its conclusions are not directed to or necessarily applicable to noncommercial businesses or to regulated utilities.

STATEMENT 1

The term *inventory* is used herein to designate the aggregate of those items of tangible personal property which (1) are held for sale in the ordinary course of business, (2) are in process of production for such sale, or (3) are to be currently consumed in the production of goods or services to be available for sale.

Discussion

3. The term *inventory* embraces goods awaiting sale (the merchandise of a trading concern and the finished goods of a manufacturer), goods in the course of production (work in process), and goods to be consumed directly or indirectly in production (raw materials and supplies). This definition of inventories excludes long-term assets subject to depreciation accounting, or goods which, when put into use, will be so classified. The fact that a depreciable asset is retired from regular use and held for sale does not indicate that the item should be classified as part of the inventory. Raw materials and supplies purchased for production may be used or consumed for the construction of long-term assets or other purposes not related to production, but the fact that inventory items representing a small portion of the total may not be absorbed ultimately in the production process does not require separate classification.

[1]Prudent reliance upon perpetual inventory records is not precluded.

By trade practice, operating materials and supplies of certain types of companies such as oil producers are usually treated as inventory.

STATEMENT 2

A major objective of accounting for inventories is the proper determination of income through the process of matching appropriate costs against revenues.

Discussion

4. An inventory has financial significance because revenues may be obtained from its sale, or from the sale of the goods or services in whose production it is used. Normally such revenues arise in a continuous repetitive process or cycle of operations by which goods are acquired and sold, and further goods are acquired for additional sales. In accounting for the goods in the inventory at any point of time, the major objective is the matching of appropriate costs against revenues in order that there may be a proper determination of the realized income. Thus, the inventory at any given date is the balance of costs applicable to goods on hand remaining after the matching of absorbed costs with concurrent revenues. This balance is appropriately carried to future periods provided it does not exceed an amount properly chargeable against the revenues expected to be obtained from ultimate disposition of the goods carried forward. In practice, this balance is determined by the process of pricing the articles comprised in the inventory.

STATEMENT 3

The primary basis of accounting for inventories is cost, which has been defined generally as the price paid or consideration given to acquire an asset. As applied to inventories, cost means in principle the sum of the applicable expenditures and charges directly or indirectly incurred in bringing an article to its existing condition and location.

Discussion

5. In keeping with the principle that accounting is primarily based on cost, there is a presumption that inventories should be stated at cost. The definition of cost as applied to inventories is understood to mean acquisition and production cost,[2] and its determin-

[2]In the case of goods which have been written down below cost at the close of a fiscal period, such reduced amount is to be considered the cost for subsequent accounting purposes.

ation involves many problems. Although principles for the determination of inventory costs may be easily stated, their application, particularly to such inventory items as work in process and finished goods, is difficult because of the variety of problems encountered in the allocation of costs and charges. For example, under some circumstances, items such as idle facility expense, excessive spoilage, double freight, and rehandling costs may be so abnormal as to require treatment as current period charges rather than as a portion of the inventory cost. Also, general and administrative expenses should be included as period charges, except for the portion of such expenses that may be clearly related to production and thus constitute a part of inventory costs (product charges). Selling expenses constitute no part of inventory costs. It should also be recognized that the exclusion of all overheads from inventory costs does not constitute an accepted accounting procedure. The exercise of judgment in an individual situation involves a consideration of the adequacy of the procedures of the cost accounting system in use, the soundness of the principles thereof, and their consistent application.

STATEMENT 4

160 Cost for inventory purposes may be determined under any one of several assumptions as to the flow of cost factors (such as first-in first-out, average, and last-in first-out); the major objective in selecting a method should be to choose the one which, under the circumstances, most clearly reflects periodic income.

Discussion

6. The cost to be matched against revenue from a sale may not be the identified cost of the specific item which is sold, especially in cases in which similar goods are purchased at different times and at different prices. While in some lines of business specific lots are clearly identified from the time of purchase through the time of sale and are costed on this basis, ordinarily the identity of goods is lost between the time of acquisition and the time of sale. In any event, if the materials purchased in various lots are identical and interchangeable, the use of identified cost of the various lots may not produce the most useful financial statements. This fact has resulted in the development of general acceptance of several assumptions with respect to the flow of cost factors (such as *first-in first-out, average,* and *last-in first-out*) to provide practical bases for the

measurement of periodic income.[3] In some situations a reversed mark-up procedure of inventory pricing, such as the retail inventory method, may be both practical and appropriate. The business operations in some cases may be such as to make it desirable to apply one of the acceptable methods of determining cost to one portion of the inventory or components thereof and another of the acceptable methods to other portions of the inventory.

7. Although selection of the method should be made on the basis of the individual circumstances, it is obvious that financial statements will be more useful if uniform methods of inventory pricing are adopted by all companies within a given industry.

STATEMENT 5

A departure from the cost basis of pricing the inventory is required when the utility of the goods is no longer as great as its cost. Where there is evidence that the utility of goods, in their disposal in the ordinary course of business, will be less than cost, whether due to physical deterioration, obsolescence, changes in price levels, or other causes, the difference should be recognized as a loss of the current period. This is generally accomplished by stating such goods at a lower level commonly designated as *market*.

Discussion

8. Although the cost basis ordinarily achieves the objective of a proper matching of costs and revenues, under certain circumstances cost may not be the amount properly chargeable against the revenues of future periods. A departure from cost is required in these circumstances because cost is satisfactory only if the utility of the goods has not diminished since their acquisition; a loss of utility is to be reflected as a charge against the revenues of the period in which it occurs. Thus, in accounting for inventories, a loss should be recognized whenever the utility of goods is impaired by damage, deterioration, obsolescence, changes in price levels, or other causes. The measurement of such losses is accomplished by

[3]Standard costs are acceptable if adjusted at reasonable intervals to reflect current conditions so that at the balance-sheet date standard costs reasonably approximate costs computed under one of the recognized bases. In such cases descriptive language should be used which will express this relationship, as, for instance, "approximate costs determined on the first-in first-out basis," or, if it is desired to mention standard costs, "at standard costs, approximating average costs."

applying the rule of pricing inventories at *cost or market, whichever is lower.* This provides a practical means of measuring utility and thereby determining the amount of the loss to be recognized and accounted for in the current period.

STATEMENT 6

As used in the phrase *lower of cost or market*[4] the term *market* means current replacement cost (by purchase or by reproduction, as the case may be) except that:

(1) Market should not exceed the net realizable value (i.e., estimated selling price in the ordinary course of business less reasonably predictable costs of completion and disposal); and

(2) Market should not be less than net realizable value reduced by an allowance for an approximately normal profit margin.

Discussion

9. The rule of *cost or market, whichever is lower* is intended to provide a means of measuring the residual usefulness of an inventory expenditure. The term *market* is therefore to be interpreted as indicating utility on the inventory date and may be thought of in terms of the equivalent expenditure which would have to be made in the ordinary course at that date to procure corresponding utility. As a general guide, utility is indicated primarily by the current cost of replacement of the goods as they would be obtained by purchase or reproduction. In applying the rule, however, judgment must always be exercised and no loss should be recognized unless the evidence indicates clearly that a loss has been sustained. There are therefore exceptions to such a standard. Replacement or reproduction prices would not be appropriate as a measure of utility when the estimated sales value, reduced by the costs of completion and disposal, is lower, in which case the realizable value so determined more appropriately measures utility. Furthermore, where the evidence indicates that cost will be recovered with an approximately normal profit upon sale in the ordinary course of business, no loss should be recognized even though replacement or reproduction costs are lower. This might be true, for example, in the

[4]The terms *cost or market, whichever is lower* and *lower of cost or market* are used synonymously in general practice and in this chapter. The committee does not express any preference for either of the two alternatives.

case of production under firm sales contracts at fixed prices, or when a reasonable volume of future orders is assured at stable selling prices.

10. Because of the many variations of circumstances encountered in inventory pricing, Statement 6 is intended as a guide rather than a literal rule. It should be applied realistically in the light of the objectives expressed in this chapter and with due regard to the form, content, and composition of the inventory. The committee considers, for example, that the retail inventory method, if adequate markdowns are currently taken, accomplishes the objectives described herein. It also recognizes that, if a business is expected to lose money for a sustained period, the inventory should not be written down to offset a loss inherent in the subsequent operations.

STATEMENT 7

Depending on the character and composition of the inventory, the rule of *cost or market, whichever is lower* may properly be applied either directly to each item or to the total of the inventory (or, in some cases, to the total of the components of each major category). The method should be that which most clearly reflects periodic income.

Discussion

11. The purpose of reducing inventory to *market* is to reflect fairly the income of the period. The most common practice is to apply the *lower of cost or market* rule separately to each item of the inventory. However, if there is only one end-product category the cost utility of the total stock—the inventory in its entirety—may have the greatest significance for accounting purposes. Accordingly, the reduction of individual items to *market* may not always lead to the most useful result if the utility of the total inventory to the business is not below its cost. This might be the case if selling prices are not affected by temporary or small fluctuations in current costs of purchase or manufacture. Similarly, where more than one major product or operational category exists, the application of the *cost or market, whichever is lower* rule to the total of the items included in such major categories may result in the most useful determination of income.

12. When no loss of income is expected to take place as a result of a reduction of cost prices of certain goods because others

forming components of the same general categories of finished products have a market equally in excess of cost, such components need not be adjusted to market to the extent that they are in balanced quantities. Thus, in such cases, the rule of *cost or market, whichever is lower* may be applied directly to the totals of the entire inventory, rather than to the individual inventory items, if they enter into the same category of finished product and if they are in balanced quantities, provided the procedure is applied consistently from year to year.

13. To the extent, however, that the stocks of particular materials or components are excessive in relation to others, the more widely recognized procedure of applying the *lower of cost or market* to the individual items constituting the excess should be followed. This would also apply in cases in which the items enter into the production of unrelated products or products having a material variation in the rate of turnover. Unless an effective method of classifying categories is practicable, the rule should be applied to each item in the inventory.

14. When substantial and unusual losses result from the application of this rule it will frequently be desirable to disclose the amount of the loss in the income statement as a charge separately identified from the consumed inventory costs described as *cost of goods sold.*

STATEMENT 8

The basis of stating inventories must be consistently applied and should be disclosed in the financial statements; whenever a significant change is made therein, there should be disclosure of the nature of the change and, if material, the effect on income.

Discussion

15. While the basis of stating inventories does not affect the over-all gain or loss on the ultimate disposition of inventory items, any inconsistency in the selection or employment of a basis may improperly affect the periodic amounts of income or loss. Because of the common use and importance of periodic statements, a procedure adopted for the treatment of inventory items should be consistently applied in order that the results reported may be fairly allocated as between years. A change of such basis may have an important effect upon the interpretation of the financial statements

both before and after that change, and hence, in the event of a change, a full disclosure of its nature and of its effect, if material, upon income should be made.

STATEMENT 9

Only in exceptional cases may inventories properly be stated above cost. For example, precious metals having a fixed monetary value with no substantial cost of marketing may be stated at such monetary value; any other exceptions must be justifiable by inability to determine appropriate approximate costs, immediate marketability at quoted market price, and the characteristic of unit interchangeability. Where goods are stated above cost this fact should be fully disclosed.

Discussion

16. It is generally recognized that income accrues only at the time of sale, and that gains may not be anticipated by reflecting assets at their current sales prices. For certain articles, however, exceptions are permissible. Inventories of gold and silver, when there is an effective government-controlled market at a fixed monetary value, are ordinarily reflected at selling prices. A similar treatment is not uncommon for inventories representing agricultural, mineral, and other products, units of which are interchangeable and have an immediate marketability at quoted prices and for which appropriate costs may be difficult to obtain. Where such inventories are stated at sales prices, they should of course be reduced by expenditures to be incurred in disposal, and the use of such basis should be fully disclosed in the financial statements.

STATEMENT 10

Accrued net losses on firm purchase commitments for goods for inventory, measured in the same way as are inventory losses, should, if material, be recognized in the accounts and the amounts thereof separately disclosed in the income statement.

Discussion

17. The recognition in a current period of losses arising from the decline in the utility of cost expenditures is equally applicable to similar losses which are expected to arise from firm, uncancel-

able, and unhedged commitments for the future purchase of inventory items. The net loss on such commitments should be measured in the same way as are inventory losses and, if material, should be recognized in the accounts and separately disclosed in the income statement. The utility of such commitments is not impaired, and hence there is no loss, when the amounts to be realized from the disposition of the future inventory items are adequately protected by firm sales contracts or when there are other circumstances which reasonably assure continuing sales without price decline.

One member of the committee, Mr. Wellington, assented with qualification, and two members, Messrs. Mason and Peloubet, dissented to adoption of chapter 4.

Mr. Wellington objects to footnote (2) to statement 3. He believes that an exception should be made for goods costed on the *last-in first-out* (LIFO) basis. In the case of goods costed on all bases other than LIFO the reduced amount (market below cost) is cleared from the accounts through the regular accounting entries of the subsequent period, and if the market price rises to or above the original cost there will be an increased profit in the subsequent period. Accounts

kept under the LIFO method should also show a similar increased profit in the subsequent period, which will be shown if the LIFO inventory is restored to its original cost. To do otherwise, as required by footnote (2), is to carry the LIFO inventory, not at the lower of cost or current market, but at the lowest market ever known since the LIFO method was adopted by the company.

Mr. Mason dissents from this chapter because of its acceptance of the inconsistencies inherent in *cost or market whichever is lower.* In his opinion a drop in selling price below cost is no more of a realized loss than a rise above cost is a realized gain under a consistent criterion of realization.

Mr. Peloubet believes it is ordinarily preferable to carry inventory at not less than recoverable cost, and particularly in the case of manufactured or partially manufactured goods which can be sold only in finished form. He recognizes that application of the *cost or market* valuation basis necessitates the shifting of income from one period to another, but objects to unnecessarily accentuating this shift by the use, even limited as it is in this chapter, of reproduction or replacement cost as *market* when such cost is less than net selling price.

APPENDIX B

Excerpts from *Accounting Principles Board Statement No. 4*

"BASIC CONCEPTS AND ACCOUNTING PRINCIPLES UNDERLYING FINANCIAL STATEMENTS OF BUSINESS ENTERPRISES"

The text of this study contains many references to *APB Statement 4*. In most instances, the references are condensed or paraphrased to cover only the substance of the material from *Statement 4* considered pertinent to the immediate discussion. This additional excerpt material is presented to provide ready access to the subject material referred to in the more complete context of the *Statement 4* presentation.

The accounting principles described in paragraph 4 of *APB Statement 4* "are those that the Board believes are generally accepted *today. The Board has not evaluated or approved present generally accepted accounting principles except to the extent that principles have been adopted in Board Opinions.* [Emphasis in original] Accordingly, *ARB 43,* Chapter 4, as reproduced in Appendix A, represents the Board's present authoritative statement of its opinion on the subject of principles underlying the accounting basis of inventories. There is no conflict between the substance of that document and its counterpart of *APB Statement 4.* Accordingly, the following excerpts from the Statement present new material on the environment, objectives and basic features of financial accounting, and certain of the pervasive principles.

Chapter 3. The Environment of Financial Accounting (paragraphs 40 to 72).

40. Accounting is a service activity. Its function is to provide quantitative information, primarily financial in nature, about eco-

nomic entities that is intended to be useful in making economic decisions—in making reasoned choices among alternative courses of action. Accounting includes several branches, for example, financial accounting, managerial accounting, and governmental accounting.

41. Financial accounting for business enterprises is one branch of accounting. It provides, within limitations described below, a continual history quantified in money terms of economic resources and obligations of a business enterprise and of economic activities that change those resources and obligations.

42. Financial accounting is shaped to a significant extent by the environment, especially by:

1. The many uses and users which it serves,
2. The overall organization of economic activity in society,
3. The nature of economic activity in individual business enterprises, and
4. The means of measuring economic activity.

Environmental conditions, restraints, and influences are generally beyond the direct control of businessmen, accountants, and statement users. Understanding and evaluating financial accounting requires knowledge of this environment and of its impact on the financial accounting process. Aspects of the environment are reflected in the basic features and basic elements of financial accounting . . . and in generally accepted accounting principles. . . .

43. Financial accounting information is used by a variety of groups and for diverse purposes. The needs and expectations of users determine the type of information required. User groups may be broadly classified into (1) those with direct interests in business enterprises and (2) those with indirect interests.

46. Financial accounting information may be directed toward the common needs of one or more of the user groups . . . or may be directed toward specialized needs. Examples of information directed toward common needs are the general-purpose reports on enterprise financial position and progress known as the balance sheet and the income statement. The emphasis in financial accounting on general-purpose information . . . is based on the presumption that a significant number of users need similar information. General-purpose information is not intended to satisfy specialized needs of individual users.

Organization of Economic Activity in Society (paragraphs 49 to 55). It is stated that all societies engage in fundamental activities

of production, income distribution, exchange, consumption, savings, and investment (paragraph 49).

52. Within producing units, the production process itself is often specialized and complex. Modern organization permits and modern technology requires long, continuous, and intricate processes in which products and services are often the joint result of several productive resources. Rapid changes in technology change patterns of inputs and of outputs and contribute to changes in their relative prices. Likewise, shifts in consumer demands and preferences affect the prices of outputs and through these the prices of inputs used in the production process.

54. The complexity and diversity of modern economic organization have implications for financial accounting:

(1) Since economic activity of business enterprises tends to be continuous, relationships associated with intervals of time like a year or a quarter of a year can be measured only on the basis of assumptions or conventional allocations.

(2) Because of the complexity of modern production and the joint nature of economic results, the relative effects of the various productive resources are intertwined, not only with each other but with external market events. Computing the precise effects of a particular input unit or a particular external event is therefore impossible except on an arbitrary basis.

(3) In a dynamic economy, the outcome of economic activity is uncertain at the time decisions are made and financial results often do not correspond to original expectations.

Measuring Economic Activity (paragraphs 66 to 72). The measure of enterprises' resources and obligations and the events that change them are stated as facilitating the comparison and evaluation of diverse economic activity.

67. The complexity, continuity, and joint nature of economic activity . . . present problems in measuring the effects of enterprise activities and associating them with specific products and services and with relatively short time periods. The need to relate measurements to each other also presents problems because it requires selecting like quantitative attributes and ignoring others. Attributes are selected on the basis of concepts that specify the attribute to be measured and how and when measurements are to be made. Disagreements over measurement concepts are the source of many of the differences of opinion about how to achieve the objectives of financial accounting and financial statements.

Chapter 4. Objectives of Financial Accounting and Financial Statements (paragraphs 73 to 113).

73. The basic purpose of financial accounting and financial statements is to provide quantitative financial information about a business enterprise that is useful to statement users, particularly owners and creditors, in making economic decisions. This purpose includes providing information that can be used in evaluating management's effectiveness in fulfilling its stewardship and other managerial responsibilities. Within the framework of these purposes financial accounting and financial statements have a number of objectives that (1) determine the appropriate content of financial accounting information (general objectives) and (2) indicate the qualities that make financial accounting information useful (qualitative objectives). The objectives provide means to evaluate and improve generally accepted accounting principles.

General Objectives (paragraphs 76 to 84). The general objectives are summarized as:

(4) . . . provide . . . . information about changes in residual interest sources and obligations of a business enterprise. (paragraph 77)

(2) . . . provide reliable information about changes in net resources . . . of an enterprise that result from its profit-directed activities. (paragraph 78)

(3) . . . provide financial information that assists in estimating the earning potential of the enterprise. (paragraph 79)

(4) . . . provide . . . . information about changes in residual interest from sources other than profit-directed activities. . . . (paragraph 80)

(5) . . . disclose . . . other information related to the financial statements that is relevant to statement users' needs. Examples . . . are information about the enterprise's accounting policies, such as depreciation and inventory methods. . . . (paragraph 81)

Qualitative Objectives (paragraphs 85 to 109).

85. Certain qualities or characteristics make financial information useful. Providing information that has each of these qualities is an objective of financial accounting. These qualitative objectives are at least partially achieved at present, although improvement is probably possible in connection with each of them. Constraints on full achievement of the qualitative objectives are

caused by conflicts of objectives, by environmental influences, and by lack of complete understanding of the objectives.

86. The qualitative objectives are related to the broad ethical goals of truth, justice, and fairness that are accepted as desirable goals by society as a whole. To the extent that the objectives are met, progress is made toward achieving the broad ethical goals as well as toward making financial information more useful. The qualitative objectives are less abstract than the ethical goals of truth, justice, and fairness and can therefore be applied more directly to financial accounting. Nevertheless, they are also generalizations that require judgment in using them to evaluate and improve accounting principles.

The statement of qualitative objectives is summarized as follows:

0-1. *Relevance.* Relevant financial accounting information bears on the economic decisions for which it is used. (paragraph 88)

0-2. *Understandability.* Understandable financial accounting information presents data that can be understood by users of the information and is expressed in a form and with terminology adapted to the users' range of understanding. (paragraph 89)

0-3. *Verifiability.* Verifiable financial accounting information provides results that would be substantially duplicated by independent measurers using the same measurement methods. (paragraph 90)

0-4. *Neutrality.* Neutral financial accounting information is directed toward the common needs of users and is independent of presumptions about particular needs and desires of specific users of the information. (paragraph 91)

0-5. *Timeliness.* Timely financial accounting information is communicated early enough to be used for the economic decisions which it might influence and to avoid delays in making those decisions. (paragraph 92)

0-6. *Comparability.* Comparable financial accounting information presents similarities and differences that arise from basic similarities and differences in the enterprise or enterprises and their transactions and not merely from differences in financial accounting treatments. (paragraph 93)

0-7. *Completeness.* Complete financial accounting information includes all financial accounting data that reasonably fulfill the requirements of the other qualitative objectives. (paragraph 94)

The statement identifies relevance as the primary qualitative objective and states that the first six are qualities desirable in all financial information reported. All information that has the six in reasonable

degree should be reported to meet the objective of completeness. (paragraphs 88 and 94)

Achieving the Objectives (paragraphs 110 to 113).

110. The objectives of financial accounting and financial statements are at least partially achieved at present, although improvement is probably possible in connection with each of them. The objectives are often difficult to achieve, however, and are usually not equally capable of attainment. Constraints on full achievement of the objectives arise from (1) conflicts of objectives, (2) environmental influences, and (3) lack of complete understanding of the objectives.

111. The pursuit of one objective or one set of objectives may conflict with the pursuit of others. It is not always possible, for example, to have financial statements that are highly relevant on the one hand and also timely on the other. Nor is it always possible to have financial accounting information that is both as verifiable and as relevant as desired. Only if all other objectives are not affected will a change in information that increases compliance with one objective be certain to be beneficial. Conflicts between qualitative objectives might be resolved by arranging the objectives in order of relative importance and determining desirable trade-offs, but, except for the primacy of relevance, neither accountants nor users now agree as to their relative importance. Determining the trade-offs that are desirable requires judgment.

Chapter 5. Basic Features and Basic Elements of Financial Accounting (paragraphs 114 to 136).

Of the thirteen statements of basic features, the following six have particular bearing on inventories:

119. F-4. *Time periods.* The financial accounting process provides information about the economic activities of an enterprise for specified time periods that are shorter than the life of the enterprise. Normally the time periods are of equal length to facilitate comparisons. The time period is identified in the financial statements.

121. F-6. *Accrual.* Determination of periodic income and financial position depends on measurement of economic resources and obligations and changes in them as the changes occur rather than simply on recording receipts and payments of money.

123. F-8. *Approximation.* Financial accounting measurements that involve allocations among relatively short periods of time and among complex and joint activities are necessarily made on the basis of estimates.

The continuity, complexity, uncertainty, and joint nature of results inherent in economic activity often preclude definitive measurements and make estimates necessary.

124. F-9. *Judgment.* Financial accounting necessarily involves informed judgment.

The estimates necessarily used in financial accounting (F-8) involve a substantial area of informed judgment. This precludes reducing all of the financial accounting process to a set of inflexible rules.

126. F-11. *Fundamentally related financial statements.* The results of the accounting process are expressed in statements of financial position and changes in financial position, which are based on the same underlying data and are fundamentally related.

128. F-13. *Materiality.* Financial reporting is only concerned with information that is significant enough to affect evaluations or decisions.

The other seven basic features are (F-1) accounting entity, (F-2) going concern, (F-3) measurement of economic resources and obligations, (F-5) measurement in terms of money, (F-7) exchange price, (F-10) general-purpose financial information, and (F-12) substance over form.

Chapter 6. Generally Accepted Accounting Principles—Pervasive Principles (paragraphs 137 to 174).

137. Financial statements are the product of a process in which a large volume of data about aspects of the economic activities of an enterprise are accumulated, analyzed, and reported. This process should be carried out in accordance with generally accepted accounting principles. Generally accepted accounting principles incorporate the consensus at a particular time as to which economic resources and obligations should be recorded as assets and liabilities by financial accounting, which changes in assets and liabilities should be recorded, when these changes should be recorded, how the assets and liabilities and changes in them should be measured, what information should be disclosed and how it should be disclosed, and which financial statements should be prepared.

138. *Generally accepted accounting principles* therefore is a technical term in financial accounting. Generally accepted accounting principles encompass the conventions, rules, and procedures necessary to define accepted accounting practice at a

particular time. The standard of "generally accepted accounting principles" includes not only broad guidelines of general application, but also detailed practices and procedures.

139. Generally accepted accounting principles are conventional —that is, they become generally accepted by agreement (often tacit agreement) rather than by formal derivation from a set of postulates or basic concepts. The principles have developed on the basis of experience, reason, custom, usage, and, to a significant extent, practical necessity.

141. In this Statement the discussion of present generally accepted accounting principles is divided into three sections: (1) pervasive principles, which relate to financial accounting as a whole and provide a basis for the other principles, (2) broad operating principles, which guide the recording, measuring, and communicating processes of financial accounting, and (3) detailed principles, which indicate the practical application of the pervasive and broad operating principles. This classification provides a useful framework for analysis, although the distinctions between the types of principles, especially between the broad operating and detailed principles, are somewhat arbitrary.

142. The three types of principles form a hierarchy. The pervasive principles are few in number and fundamental in nature. The broad operating principles derived from the pervasive principles are more numerous and more specific, and guide the application of a series of detailed principles. The detailed principles are numerous and specific. Detailed principles are generally based on one or more broad operating principles and the broad operating principles are generally based on the pervasive principles. No attempt is made in this Statement to indicate specific relationships between principles.

143. The pervasive principles specify the general approach accountants take to recognition and measurement of events that affect the financial position and results of operations of enterprises. The pervasive principles are divided into (1) pervasive measurement principles and (2) modifying conventions.

Pervasive Measurement Principles (paragraphs 144 to 168). These principles are described as representing the basis for implementing accrual accounting. They include the initial recording principle (exchange prices at which transfers take place), the realization principle, three expense recognition principles, and the unit of measurement principle (U.S. dollars in the United States). The realization and expense recognition principles underlie conventional income determination practices (paragraph 144).

147. *Income Determination.*[43] Income determination in accounting is the process of identifying, measuring, and relating revenue and expenses of an enterprise for an accounting period. Revenue for a period is generally determined independently by applying the realization principle. Expenses are determined by applying the expense recognition principles on the basis of relationships between acquisition costs and either the independently determined revenue or accounting periods. Since the point in time at which revenue and expenses are recognized is also the time at which changes in amounts of net assets are recognized, income determination is interrelated with asset valuation. From the perspective of income determination, costs are divided into (1) those that have "expired" and become expenses and (2) those that are related to later periods and are carried forward as assets in the balance sheet. From the perspective of asset valuation, those costs that no longer meet the criteria of assets become expenses and are deducted from revenue in determining net income.

[43] The term *matching* is often used in the accounting literature to describe the entire process of income determination. The term is also often applied in accounting, however, in a more limited sense to the process of expense recognition or in an even more limited sense to the recognition of expenses by associating costs with revenue on a cause and effect basis (see paragraph 157). Because of the variety of its meanings, the term *matching* is not used in this Statement.

150. Revenue is conventionally recognized at a specific point in the earning process of a business enterprise, usually when assets are sold or services are rendered. This conventional recognition is the basis of the pervasive measurement principle known as realization.

P-2. *Realization.* Revenue is generally recognized when both of the following conditions are met: (1) the earning process is complete or virtually complete, and (2) an exchange has taken place.

156. Three pervasive expense recognition principles specify the bases for recognizing the expenses that are deducted from revenue to determine the net income or loss of a period. They are "associating cause and effect," "systematic and rational allocation," and "immediate recognition."

157. P-3. *Associating cause and effect.*[47] Some costs are recognized as expenses on the basis of a presumed direct association with specific revenue.

[47] The term *matching* is often applied to this process (see paragraph 147, footnote 43).

Although direct cause and effect relationships can seldom be conclusively demonstrated, many costs appear to be related to particular revenue and recognizing them as expenses accompanies recognition of the revenue. Examples of expenses that are recognized by associating cause and effect are sales commissions and costs of products sold or services provided.

158. Several assumptions regarding relationships must be made to accumulate the costs of products sold or services provided. For example, manufacturing costs are considered to "attach" to products on bases of association such as labor hours, area or volume of facilities used, machine hours, or other bases presumed to indicate the relationship involved. "Attaching" costs to products often requires several allocations and reallocations of costs. Also, assumptions regarding the "flow" of costs or of physical goods (LIFO, FIFO, average) are often made to determine which costs relate to products sold and which remain in inventory as assets.

159. P-3. *Systematic and rational allocation.* In the absence of a direct means of associating cause and effect, some costs are associated with specific accounting periods as expenses on the basis of an attempt to allocate costs in a systematic and rational manner among the period in which benefits are provided.

If an asset provides benefits for several periods its cost is allocated to the periods in a systematic and rational manner in the absence of a more direct basis for associating cause and effect. The cost of an asset that provides benefits for only one period is recognized as an expense of that period (also a systematic and rational allocation). This form of expense recognition always involves assumptions about the pattern of benefits and the relationship between costs and benefits because neither of these two factors can be conclusively demonstrated. The allocation method used should appear reasonable to an unbiased observer and should be followed systematically. Examples of items that are recognized in a systematic and rational manner are depreciation of fixed assets, amortization of intangible assets, and allocation of rent and insurance. Systematic and rational allocation of costs may increase assets as product costs or as other asset costs rather than increase expenses immediately, for example, depreciation charged to inventory and costs of self-constructed assets. These costs are later recognized as expenses under the expense recognition principles.

160. P-5. *Immediate recognition.* Some costs are associated with the current accounting period as expenses because (1) costs incurred during the period provide no discernible future benefits, (2) costs recorded as assets in prior periods no longer provide discernible benefits or (3) allocating costs either on the basis of association with revenue or among several accounting periods is considered to serve no useful purpose.

Application of this principle of expense recognition results in charging many costs to expense in the period in which they are paid or liabilities to pay them accrue. Examples include officers' salaries, most selling costs, amounts paid to settle lawsuits, and costs of resources used in unsuccessful efforts. The principle of immediate recognition also requires that items carried as assets in prior periods that are discovered to have no discernible future benefit be charged to expense, for example, a patent that is determined to be worthless.

163. Under the initial recording, realization, and expense recognition principles assets are generally carried in the accounting records and presented in financial statements at acquisition cost or some expired or unamortized portion of it. When assets are sold, the difference between the proceeds realized and the unamortized portion of acquisition cost is recognized as an increase or decrease in the enterprise's net assets.

164. The initial recording and realization conventions are the basis for the "cost principle" (which is more accurately described as the acquisition-price or historical-cost rule). Cost can be defined in several ways—for example, as the amount of money that would be required to acquire assets currently (replacement cost) or as the return from alternative uses of assets, such as selling them (opportunity cost). However, "cost" at which assets are carried and expenses are measured in financial accounting today usually means historical or acquisition cost because of the conventions of initially recording assets at acquisition cost and of ignoring increases in assets until they are exchanged (the realization convention). The term *cost* is also commonly used in financial accounting to refer to the amount at which assets are initially recorded, regardless of how the amount is determined.

Modifying Conventions (paragraphs 169 to 174).

169. The pervasive measurement principles are largely practical responses to problems of measurement in financial accounting and do not provide results that are considered satisfactory in all circumstances. Certain widely adopted conventions modify the application of the pervasive measurement principles. These modifying conventions, discussed in the following paragraphs, have evolved to deal with some of the most difficult and controversial problem areas in financial accounting. They are applied because rigid adherence to the pervasive measurement principles (1) sometimes produces results that are not considered to be desirable, (2) may exclude from financial statements some events that are considered to be important, or (3) may be impractical in certain circumstances.

170. The modifying conventions are applied through generally

accepted rules that are expressed either in the broad operating principles or in the detailed principles. The modifying conventions are a means of substituting the collective judgment of the profession for that of the individual accountant.

171. *Conservatism.* Frequently, assets and liabilities are measured in a context of significant uncertainties. Historically, managers, investors, and accountants have generally preferred that possible errors in measurement be in the direction of understatement rather than overstatement of net income and net assets. This has led to the convention of conservatism, which is expressed in rules adopted by the profession as a whole such as the rules that inventory should be measured at the lower of cost and market and that accrued net losses should be recognized on firm purchase commitments for goods for inventory. These rules may result in stating net income and net assets at amounts lower than would otherwise result from applying the pervasive measurement principles.

172. *Emphasis on Income.* Over the past century businessmen, financial statement users, and accountants have increasingly tended to emphasize the importance of net income and that trend has affected the emphasis in financial accounting. Although balance sheets formerly were presented without income statements, the income statement has in recent years come to be regarded as the most important of the financial statements. Accounting principles that are deemed to increase the usefulness of the income statement are therefore sometimes adopted by the profession as a whole regardless of their effect on the balance sheet or other financial statements. For example, the last-in, first-out (LIFO) method of inventory pricing may result in balance sheet amounts for inventories that become further removed from current prices with the passage of time. LIFO, however, is often supported on the grounds that it usually produces an amount for cost of goods sold in determining net income that more closely reflects current prices. This result is believed to compensate for the effect under the LIFO method of presenting inventories in the balance sheet at prices substantially different from current prices.

173. *Application of Judgment by the Accounting Profession as a Whole.* Sometimes strict adherence to the pervasive measurement principles produces results that are considered by the accounting profession as a whole to be unreasonable in the circumstances or possibly misleading. Accountants approach their task with a background of knowledge and experience. The perspective provided by this background is used as the basis for modifying accounting treatments when strict application of the pervasive measurement principles yields results that do not appear reasonable to the profession as a whole.

Chapter 7. Generally Accepted Accounting Principles—Broad Operating Principles (paragraphs 175 to 201).

175. The broad operating principles guide in selecting, measuring, and reporting events in financial accounting. They are grounded in the pervasive principles discussed in Chapter 6 and are applied to specific situations through the detailed principles discussed in Chapter 8. The broad operating principles are broader and less specific than the detailed principles. For example, the detailed principle of first-in, first-out inventory pricing is one application of the broad operating principles of product cost determination and asset measurement, and straight-line depreciation is one of the detailed principles through which the broad operating principles that deal with systematic and rational expense allocation are applied. Although the broad operating principles are more specific than the pervasive principles, they are also generalizations. Consequently, exceptions to the broad operating principles may exist in the detailed principles through which they are applied.

176. The financial accounting process consists of a series of operations that are carried out systematically in each accounting period. The broad operating principles guide these operations. The operations are listed separately although they overlap conceptually and some of them may be performed simultaneously:

(1) *Selecting* the events. Events to be accounted for are identified. Not all events that affect the economic resources and obligations of an enterprise are, or can be, accounted for when they occur.

(2) *Analyzing* the events. Events are analyzed to determine their effects on the financial position of an enterprise.

(3) *Measuring* the effects. Effects of the events on the financial position of the enterprise are measured and represented by money amounts.

(4) *Classifying* the measured effects. The effects are classified according to the individual assets, liabilities, owners' equity items, revenue, or expenses affected.

(5) *Recording* the measured effects. The effects are recorded according to the assets, liabilities, owners' equity items, revenue, and expenses affected.

(6) *Summarizing* the recorded effects. The amounts of changes recorded for each asset, liability, owners' equity item, revenue, and expense are summed and related data are grouped.

(7) *Adjusting* the records. Remeasurements, new data, corrections, or other adjustments are often required after the events have been initially recorded, classified, and summarized.

(8) *Communicating* the processed information. The information is communicated to users in the form of financial statements.

The broad operating principles, which guide these eight operations, are divided into (1) principles of selection and measurement and (2) principles of financial statement presentation.

The substance of *ARB 43*, Chapter 4, principles underlying inventory accounting, is incorporated in the broad operating principles set forth in Chapter 7 of *APB Statement 4*, all within the framework of the foregoing descriptions of the accounting environment, financial accounting objectives, features, and pervasive principles, and in terms of the foregoing guides to selection and measurement.

APPENDIX C

Feasibility of Applying Uniform Cost-Accounting Standards

Digest of a report on the feasibility of applying uniform cost-accounting standards to negotiated defense contracts by the Comptroller General of the United States to the Committee on Banking and Currency, House of Representatives, 91st Congress, Second Session, January 1970 (pages vii and viii).

Why the Study Was Made

A 1968 amendment to the Defense Production Act of 1950—Public Law 90-370—directed the General Accounting Office (GAO) to study the feasibility of applying uniform cost accounting standards to negotiated defense contracts of $100,000 or more.

A growing proportion of purchases—or procurements—by the Department of Defense (DOD) have been contracted for on a negotiated rather than a formally advertised bid basis.

In the last five (fiscal) years an average of over 86 percent of DOD procurements by contract were obtained through negotiation. Out of an average of approximately $38 billion a year awarded for military procurements, approximately $33 billion was committed through negotiated contracts.

In fiscal year 1969, 89 percent of military procurement—over $36 billion—was obtained by contract negotiation. In the same year, Government-wide negotiated procurement represented $46 billion out of a total procurement of $53 billion or more than 86 percent.

During the Congressional debate prior to enacting the legislation views were expressed that uniform cost-accounting standards are necessary mainly because of substantially increased costs of pro-

curement and difficulties in contract administration. In a negotiated bid situation the estimate of a contractor's cost plays an important role in the establishment of the price. The cost of any specific order can only be measured by the application of cost accounting principles.

In the Senate debate the view was expressed that the essential function of cost accounting is to allocate direct and overhead costs to individual orders. Thus, the cost-accounting principles followed have a large impact on the determination of contractor costs.

It was pointed out in the debate that in the absence of "uniform principles" the entire burden is placed upon procurement officials to evaluate the contractor's accounting practices without the guidance of costs standards recognized by Government and industry.

Findings and Conclusions

"General cost principles and procedures" for use in negotiated Defense contracts are contained in Section XV of the Armed Services Procurement Regulation (ASPR). However, the effectiveness of section XV is impaired because:

—It makes frequent references to generally accepted accounting principles and/or regulations of the Internal Revenue Service, neither of which was intended to serve contract costing purposes.

—It lacks specific criteria for the use of alternative accounting principles and indirect cost allocation methods.

—It is of limited applicability, since it is mandatory for only cost-reimbursement type contracts.

Uniform cost-accounting standards could provide a common frame-work for estimating prospective cost or for the determination of the actual cost of a contract. They could provide the guidance, support, and coordination required for better understood estimates and subsequent reports of actual costs.

It is feasible to establish and apply cost-accounting standards to provide a greater degree of uniformity and consistency in cost accounting as a basis for negotiating and administering procurement contracts.

However, under all the wide variety of circumstances involved in Government contracting, it is not feasible to establish and apply cost-accounting standards in such detail as would be necessary to ensure a uniform application of precisely prescribed methods of computing costs for each of the different kinds of cost.

Cost-accounting standards should not be limited to Defense cost-type contracts. They should apply to negotiated procurement

contracts and subcontracts, both cost-type and fixed price. They should be made applicable Government-wide.

Cumulative benefits from the establishment of cost-accounting standards should outweigh the cost of implementation.

New machinery should be established for the development of cost-accounting standards. The objective should be to adopt at an early date the standards of disclosure and consistency and to strive for the elimination of unnecessary alternative cost-accounting practices.

Contractors should be required to maintain records of contract performance costs in conformity with cost-accounting standards and any approved practices set forth in a disclosure agreement or be required to maintain the data from which such information could be readily provided.

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