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# ADVANCED ACCOUNTING

# Advanced Accounting

## VOLUME I

## CORPORATE CAPITAL AND INCOME

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# *PREFACE*

IN THIS TEXT THE AUTHORS have attempted to treat in a comprehensive manner the many accounting problems arising in the determination of, and the classification of, corporate capital and periodic income. These problems have been of interest to accountants for many decades but this interest has become accentuated in recent years. In fact, so much emphasis has been placed on them that they rate a first-line position in any discussion of contemporary accounting.

Since this text presupposes that the student has already completed his study of intermediate accounting, the authors have included in the coverage of this volume a great deal of advanced material on both accounting theory and problem solution techniques. The discussion has been so organized, however, that it will serve as an elaboration of the student's prior knowledge and at the same time afford him an opportunity to review the fundamentals developed in part in prior courses or independent study.

The chapters are arranged in a logical sequence. After some background material has been presented in Chapter 1, the difficulties involved in the determination of corporate proprietorship are discussed and illustrated in a group of five chapters. The middle five chapters treat in a comprehensive manner both the mathematical and the accounting aspects of investments and fixed assets (including appraisals). The last five chapters are devoted to the technical difficulties involved in the determination of periodic business income. The authors have not purposely slighted any major or minor problem associated with what in recent years has been called "financial accounting."

In the development of the many topics treated in this volume, the authors have made full use of bulletins, releases, and monographs of the American Accounting Association, the Securities and Exchange Commission, and the American Institute of Accountants. This material has been integrated into the text discussion and illustrations as thoroughly as possible in order to make the treatment authoritative and complete. Many of the illustrations are based on the conclusions and recommendations of the three organizations just mentioned, but the authors have not hesitated to present their own opinions and views wherever it seemed appropriate to do so. The authors wish to express their appreciation for permission to quote these authoritative writings on accounting standards.

As is well known, the major emphasis in modern financial accounting is on the statement of periodic income rather than on the balance sheet. In the preparation of this text, the authors have taken full cognizance of this trend, but the traditional emphasis on balance sheet valuation problems has not been unduly slighted. In fact, the proper valuation for balance sheet purposes of most of the current as well as the fixed assets is discussed and illustrated at length in the several chapters. The major emphasis of the text, however, is on income determination. In view of the trend of thinking in recent years, the authors believe that this heavy emphasis is warranted.

Attention is especially invited to Chapters 7 and 10 which are concerned with the mathematical aspects of capitalization, amortization, and real estate valuation. In relatively short compass, the authors have attempted to present the basic formulas and techniques employed in the day-by-day valuation activities of accountants and appraisers. The illustrations in these two parts of the text are unusually complete for a volume which is essentially non-mathematical in nature. It may be observed also that some of the material in Chapter 10 on real property valuation is drawn from sources which are now out of print; in addition, it is often difficult for the accountant to find a coverage of this important matter in the books in his personal library. This material may be omitted, however, without disturbing the continuity of the text. Sufficient compound interest and other tables are included in the back of this text for aid in solving the problems and exercises which accompany Chapters 7 through 10. These tables have been taken with permission from Professor William L. Hart's *Mathematics of Investment*, Third Edition. The authors desire to express their appreciation to Professor Hart for his kindness in allowing these tables to be reproduced in this volume. The reader is referred to Professor Hart's well-known text for further elaboration of actuarial science and a complete set of tables.

The attention of the reader is also invited to the thorough discussion and illustration of the important subjects of treasury stock and capital stock retirement in Chapter 3, the treatment of surplus and reserves in Chapters 4 and 5, and the exhaustive coverage of fixed asset appraisals in Chapter 11. In view of the recurring interest in stabilized accounting, Chapter 16 is devoted entirely to an exposition and illustration of this timely subject.

Since this volume contains an unusually large number of citations and references to various accounting and legal authorities, a bibliographical code has been adopted in order to save space. The explanation of the use of this coding system is given in Appendix A immediately prior to the listing of the bibliographical sources. The authors believe that the exhaustive citations and references not only make the text discussion more

authoritative, but they also aid the reader in finding additional material for independent further study.

The coverage of this text includes some matters which are quasi-legal in nature (principally income tax). In view of this fact, several of the chapters have sections devoted to judicial discussion; these sections are appropriately referenced to statutes and court decisions. However, the discussion of the law in these instances is not intended to be exhaustive; it is simply given in order to supply the accounting-minded reader or student with the orientation necessary for a full comprehension of the topics and problems treated in the text.

Another feature of the text should also be mentioned at this point, namely, the emphasis on the relationship of accountants and their practice to the work of the Securities and Exchange Commission. The activities and attitudes of the Commission in several important areas of accounting are carefully explained and illustrated.

In the preparation of this text the needs of several groups of persons were kept constantly in mind:

1. *Undergraduate and graduate students in accounting in the schools and colleges offering instruction on an advanced level.* In regard to this use, the authors have included some discussion which is partly of a review nature in order to integrate the subject matter of this volume with orthodox courses in intermediate accounting. Because of this, there should be no difficulty in making the transition to the material taken up in this text.

2. *Persons interested in reviewing for professional accounting examinations.* In regard to this use, the authors have included many suggestions for expediting the solutions to examination problems. The accompanying problem pamphlet contains representative samples of problems given on prior examinations. As is generally known, the subjects covered in this volume have been rather popular on professional examinations in the past, and there is no reason to believe they will be slighted in the future. The authors hope, therefore, that candidates for (and instructors of) Certified Public Accountant examination review courses will find the material contained herein of considerable use.

3. *Practitioners — accounting and legal.* As mentioned above, this volume contains considerable material on the relationships between accounting and law. This coverage should prove helpful to the many practitioners who are now actively engaged in handling matters relating to valuation, income determination, dividends, capital stock, surplus, and reserves.

The arrangement of the chapters and subject matter allows for considerable flexibility in classroom use. Some instructors, for example, may wish to stress the theory aspects of the topics taken up, while others may desire to emphasize problems and problem solution technique. Still others

may wish to cover both theory and problems in so far as class time will permit. Most of the text and a substantial percentage of the problems can be covered in the usual three semester-hour course; there is ample material, however, for a more extended coverage, especially if the text is used in a course offered on the graduate level.

The problems for each chapter, which are published separately as *Advanced Accounting Problems, Book 1*, are divided into two groups: (1) class and homework exercises, and (2) homework problems. The latter are somewhat more challenging and difficult to solve and solution hints are given the students at the conclusion of each set of facts. (There are no problems or exercises for Chapter 1.) There is sufficient problem material to allow the individual teacher great latitude in his selection of out-of-class assignments. While some of the problems are adapted from recent Certified Public Accountant examinations, there are a number of original ones.

Since there is a growing trend toward graduate work in the accounting area, the authors believe that certain of the problems accompanying this text are sufficiently challenging to be assigned for the attention of graduate students. The specific ones in this category have been marked with a star (*). The starring of a problem, however, does not necessarily mean that it should not be assigned in undergraduate courses, especially those devoted to Certified Public Accountant examination review.

A considerable portion of this text and accompanying problems has been tested by actual class use in two preliminary editions. These materials were studied by several hundred persons in three different, large universities. The authors are grateful for the helpful, constructive criticisms which they received from the students and instructors in the several classes which used the preliminary editions. Special acknowledgment and thanks are due to Professors W. P. Carr, C.P.A., of Loyola University, New Orleans; Bruce Futhey, C.P.A., of Michigan State College; Ralph C. Russell, C.P.A., of the Texas College of Arts and Industry; and John A. White, of the University of Texas. The Research Committee of the University of Alabama made its resources available by furnishing clerical and other financial assistance; this assistance materially helped in making this volume possible. The authors are indebted also for editorial assistance furnished by several of their associates and former students who are given specific recognition and credit in the footnotes of the chapters contained in this volume. For the help and sympathetic interest of these men the authors wish hereby to express their deep appreciation.

G. H. Newlove
S. Paul Garner

# CONTENTS

1. Business and Accounting Entities 3

Introduction. Governing contract. Seat of authority. Continuity of existence. Basis of taxation. Status and liability of owners. Concept of legal entity. Proprietary and entity theories of accounting.

2. Business Capital and Capital Stock 26

Concepts of capital — general. Economic capital. Business capital. Capital arising from unrealized appreciation. Capital arising from non-owners. Contributed, paid-in, or invested capital. Accounts for contributed capital. Legal or stated capital. Capitalization defined. Kinds of capital stock. Subscriptions to corporate stock. Stock certificates — accounting aspects. Original opening entries for par value capital stock. Original opening entries for no-par value capital stock. No-par forfeited stock. Payment for capital stock. Reservations of capital stock. Organization costs.

3. Treasury Stock and Capital Stock Retirement 70

Treasury stock — general. Legal status of treasury stock. Treasury stock on the balance sheet. Journalization of treasury stock — introductory. Entries for purchased no-par treasury stock. Sale of treasury shares purchased at several dates. Donated treasury stock — general. Reserve for purchased treasury stock. Treasury stock acquired by forfeiture. Sale of illegally acquired treasury shares. Treasury stock pledged as collateral. Recording transfer of treasury stock. Retirement of capital stock.

4. Surplus and Surplus Reserves 107

Nature of surplus. Classes of surplus. Earned surplus or retained income. Quasi-reorganization and "dated" earned surplus. Capital surplus. Paid-in surplus. Donated surplus. Résumé of surplus classifications. Premium and discount on capital stock. Donations from stockholders. Paid-in surplus from forfeited subscriptions. Revaluation surplus. Simple recapitalizations. Recorded surplus reserves. Unrecorded ("secret") surplus reserves. Reconciliation of surplus and reported profits. Work sheets for correcting financial statements. Statement of surplus. Book value of capital stock.

5. Non-Surplus Reserves 148

Reserves — introductory. Pure budgetary reserves. Pure valuation reserves. Budgetary-valuation reserves. Valuation-budgetary reserves. Valuation-accrual reserves. Liability-accrual reserves. Budgetary-liability reserves. Unrealized surplus reserve. Appropriated earned surplus reserves.

6. Corporate Dividends: Legal and Accounting Aspects 178

General. Purposes of dividend regulation. Restrictions on dividends: common law and statutes. Problems of corporate surplus administration. Accountancy dividend standards. Directors' discretion as to dividends. Dividend dates. Dividends from paid-in surplus. Dividends from proceeds of life insurance policies. Dividends from surplus at acquisition. Preferred dividends during construction of fixed assets. Dividends of holding companies. Guaranteed dividends. Issuer's entries for stock dividends. Reversal of stock dividend. Dividends in property which has appreciated in value.

7. Mathematical Aspects of Capitalization and Amortization 204

Need for mathematical simplicity. Single payment at specified date. Relationship between effective and nominal interest rates. Patterns as to dates of payments which are constant in amount. Compound amount of annuity when each payment is $1. Present worth of annuity when each payment is $1. Present worth of perpetuities when each payment is $1. Equations for annuities and perpetuities when periodic payments are $I. Constant payments when payment period is other than a year and interest rate is nominal. Series when payments are irregular. When payment and conversion periods coincide. Limitation of accountant's activity with appraisals. Evaluation of income producing property. Adaptation of Hoskold formula for valuing constant periodic income. Criticism of Hoskold formula. Determination of speculative interest rate. Makeham's formula for valuing loans. Mathematics of periodic debt retirement. Annuities as investments. Perpetuities as investments.

8. Accounting for Securities 241

Introduction. Taxation of dividends — general. Stock dividends. Property dividends. Date dividend is taxable. Passed cumulative dividends at acquisition. Privileged subscriptions. Stock rights. Stock purchase warrants. Blocks of securities combined by reorganization. Adjustments to original tax basis. Securities acquired prior to March 1, 1913. Bonds purchased with interest in default. Bonds acquired by issuing corporation for sinking fund. Accommodation

paper (notes and acceptances). Notes purchased on a discount basis. Valuation of noncurrent asset investments. Bond tables. Ordinary semiannual bonds. Bonds bought or sold on yield basis between interest dates with accrued interest. Partial redemption of unmatured bonds. Determination of yield. Short terminal bonds. Annual bonds. Quarterly bonds. Irredeemable bonds. Serial bonds. Financial decisions concerning bonds. Kinds of mortgages. Serial-plan mortgages. Amortization-plan mortgages. Industrial bank loan interest rates. Installment contract interest rates.

9. Accounting for Fixed and Intangible Assets at Cost 292

Introduction. Planning fixed asset additions. Accounting for the cost of moving fixed assets. Involuntary conversion of fixed assets. Depreciation in an expanding business. Depreciation based on units of output. Depreciation schedule. Sinking fund, annuity, and compound interest. Constant percentage on diminishing base method of computing depreciation. Depletion under Hoskold formula. Depreciation under the group system. Returnable containers. Leases as annuities. Lump sum payments in lieu of rent. Valuation of leases. Periodic rent when lessee makes improvements. Premium for lease renewal. Presentation of long-term leases on financial statements. Hire-purchase agreements. Amortization of intangible assets.

10. Determining Values of Real Property 326

Purpose of discussion. Total return on real property. Fee simple title with building of highest and best use. Fee simple with building not of highest and best use. Leased fees. Leasehold estates.

11. Fixed Asset Appraisals 351

Definitions. Illustration of an appraisal report. Advisability of recording appraisals. Statistics on bases of valuation adopted by business firms. Income tax and appraisals. Effects of recording appreciation on income and earned surplus. Journalization of appreciation. Effect of devaluation on income and earned surplus. Journalization of devaluation. Balance sheet treatment of appraisal accounts. Reappraisal of appraisal. Disposal of appreciated fixed asset. Conclusions on appreciation and devaluation. Fixed asset appraisals — adjustments of accumulated depreciation. Journalization of adjustment in cost caused by increase in service life. Effect of decrease in service life on income and earned surplus. Journalization of adjustment in cost caused by decrease in service life. Entries for second revision of service life. Balance sheet treatment of adjustments

to service life. Conclusions as to changes in service life. Depreciation of war emergency facilities. Valuation-budgetary reserves and appraisals. Incorporation of firms owning depreciable or depletable assets. Donation of fixed assets.

12. Nature of Business Income and its Realization 392

Business income and economic income. Modern emphasis on income reporting. Accounting problems arising from the transition of emphasis. Income statement terminology. Single step statements versus the multiple step. Premises for income determination. Income and saving distinguished. Unusual problems of realization. Work sheet for determining amount of guaranteed income.

13. Periodicity Factor and Business Income 413

Importance of the problem of income periodicity. The matching problem — general. Techniques for matching. Costs, expenses, and losses. Relation of conservatism to periodic income. Inventory realization in relation to periodic income. Unusual gains and losses and periodic income. Unusual items and the Securities and Exchange Commission. Statistics on number and amounts of direct charges and credits to surplus. Employee pensions and periodic income. Retiring and refunding bonds in relation to periodic income.

14. Periodicity Factor and Business Income (Concluded) 458

Periodic income and capital maintenance. Depreciation expense in a period of high asset cost. "Smoothing" the reported periodic income. Relation of imputed costs to periodic income. Relation of installment sales of personal property to periodic income. Installment method for real estate sales. Costing for real estate subdivisions. Employee stock options. Consignment sales. Accounting for construction contracts.

15. Foreign Branches and Subsidiaries 515

Introduction. Conversion of account balances of foreign branches and subsidiaries. Exchange conversion rates after devaluation of foreign currencies. Foreign manufacturing branch or agency. Exchange adjustment account. Income tax questions arising from foreign transactions. Foreign subsidiaries. Consolidation of statements of foreign subsidiary and parent company. English subsidiary. Canadian subsidiary.

16. Stabilized Accounting 547

Origin of stabilized accounting. Effects of inflation on the balance sheet. Stabilized accounting concept of capital. Stabilized depreciation. Stabilized appreciation. Stabilized accounting concept of income. Technique of stabilized accounting. Objections to stabilized accounting. Alternative methods based on stabilized accounting. Capital price adjustment method. Common dollar reporting. Three-part income statements. Special capital reserve method. Summary.

Appendix A 573

Appendix B 577

Index 615

# ADVANCED ACCOUNTING

# *CHAPTER 1*

## Business and Accounting Entities

**Introduction.** Accounting is principally associated with what is termed the "business entity." In fact, its whole philosophy and development have been colored and influenced by the necessity of limiting its primary field of investigation and practice to individual business organizations or institutions. It is interesting to observe that this limitation has been both a helpful and a deterring factor in the full natural evolution of accounting. It has, on the one hand, contributed to the remarkable growth of specialized techniques and practices requisite to the recording of day by day transactions within each enterprise, such as control accounts and machine devices. Looking at accounting solely from this point of view, progress has been generally satisfactory. In fact, it may well be stated that accounting as the ". . . art of recording, classifying and summarizing . . . transactions and events . . ." [1] has attained a high degree of perfection.

Viewed in another way, however, the "business entity" relationship has not been conducive to much inquiry into the broad social implications of accounting, particularly those concerned with the accounting for the corporation. The latter have only begun to be investigated within the past few years, with the result that accounting is now being viewed by some individuals in a perspective almost entirely distinct from the traditional associations and responsibilities. Progress along this line has been necessarily slow and hesitant, but none the less sure. Some outside-of-the-profession forces (such as the Securities and Exchange Commission) have contributed in part to the enlarged conception of the function of accounting in the general social economy.

A large number of the perplexing and controversial problems and questions, which have arisen in accounting during the last twenty years, have been occasioned, in part at least, by the change of emphasis referred to above. No major accounting problem or decision should be viewed at the present time without a consideration of both the narrow and the broad implications of accounting procedures. Many questions and practices which arise can be explained only in terms of the respective accounting philosophies which underlie them. In the first few chapters of this volume, therefore, considerable attention is devoted to the legal and economic aspects of accounting matters with no neglect, however, of the journal entries possible under various situations.

[1] 7 *Accounting Research Bulletin No. 58.*

Since the concept of a business entity is so important, this particular chapter reviews the data relative to the more important types of multi-owned business organizations for the purpose of stressing the points of special interest to accountants. These topics include the contracts governing the various types of business enterprises, the location of executive authority, the various bases for taxation, and the legal status of the owners. The proprietorship and the entity theories of accounting are also explained, with emphasis upon their implications.

**Governing contract.** All types of multi-owned business organizations are created by a formal or implied legal agreement between the contracting parties. The form of this agreement, which is sometimes a written contract and sometimes an implied contract, differs with the type of business organization. The following types are considered in this chapter:

1. Ordinary or general partnerships
2. Statutory limited partnerships
3. Mining partnerships
4. Syndicates or joint ventures
5. Joint stock companies
6. Partnership associations
7. Business trusts (Massachusetts trusts)
8. Private business corporations

The ordinary partnership may be created by either an expressed or implied agreement. The expressed type is the more popular and the "expression" may be in a written or oral form. As is well known, however, it is preferable that the articles of copartnership be in writing (in order to avoid disputes), and they should give detailed information as to the name, amount of monetary and service contribution to the firm, rights, duties, powers and liabilities of each partner, the name and duration of the firm, the method of dividing profits and losses, and the provision for distribution of assets in dissolution. Implied partnerships and partnerships by estoppel are rather rare and are of little importance *per se* to the accountant.[2]

The statutory limited partnership is formed by securing a certificate or articles from the state; the statute relating to this form of organization must be fulfilled in all respects or else the firm will be held a general partnership. It should be specifically noted that the limited partnership is not recognized at common law, and that each firm of this type must have at least one partner with unlimited liability.[3] Since the laws of many states differ in respect to the salient features of this form of enterprise, it is not looked on with favor in those instances where the business is carried on

[2] See (1938) Crane 62–64.

[3] All the states except Arizona and Florida have made provision for this form of organization.

interstate. (The "limited" partners in the state where the certificate is secured may become "general" partners in the eyes of jurists of other states.[4])

Mining partnerships are of interest to the accountant primarily because of the unusual profit-sharing arrangements permitted. The organization may be formal or informal depending upon the needs of the parties. Some states, such as Montana and Idaho, have enacted statutes which cover the pertinent features of the establishment of the mining partnership, but in other states an informal arrangement may be adopted, especially where the results of the mining operations are extremely doubtful. Since the common law must necessarily be effective in these jurisdictions where there is no statute, a mining partnership may be formed by the association of two or more persons for the purpose of acquiring a mining claim and operating a mine. No written agreement is required in the latter event, and the custom of the community will govern as to the specific details of the organization.[5]

Syndicates are often referred to as "joint ventures" [6] or "deals," and may be formed by an expressed or implied agreement. Their field of operation at the present time is limited for the most part to the acquiring and distribution of securities. There may be, for example, "purchase syndicates" which divide the responsibility and liability of purchasing securities from the issuing firm, and "selling syndicates" which split the work of distributing the bonds or stocks to the general public. The latter may be of two types: (a) limited liability and (b) unlimited liability. In most cases the control and power to contract liabilities are in the hands of a syndicate manager who keeps the records and divides the profits and losses according to the predetermined agreement. The proprietorship elements are normally not transferable without permission of the manager. Most syndicates are organized for only a short time, but their lives may be extended if necessary in order to carry out their purposes.[7]

Joint stock companies are in many respects similar to corporations, but

[4] The Uniform Limited Partnership Act, however, is in force in twenty-five states, and it covers this point. For a more lengthy discussion of this matter see Howard, 7 *The Journal of Business of the University of Chicago* 296–317.

[5] For further information see Rowley, S., *Modern Law of Partnership* (Indianapolis: Bobbs-Merrill Co., 1916), Sections 152–153, 1048. One authority has stated that "the mining partnership is apparently a contradiction to almost all the usually accepted ideas of partnerships. This type of business and financial structure has many useful characteristics; if developed, it would find considerable use in modern business." Burtchett, F. F., *Corporation Finance* (New York: Harper and Brothers, 1934), p. 286. See also Jones, 13 *Texas Law Review* 410.

[6] In *Nowland Realty Co. v. Commissioner of Internal Revenue*, 47 Fed. (2nd) 1018, it was stated that a "syndicate is not a corporation, but in character is somewhat like a joint adventure."

[7] Syndicate law is found only in the reported decisions. Most books on investment and corporate finance discuss syndicates at length. See Dolley, J. C., *Principles of Investment* (New York: Harper and Brothers, 1940), pp. 297–327.

no charter is required for their formation. Instead, a contract known as the "articles of association" is signed by the various interested parties. The ownership is indicated by shares, comparable to stock certificates, of equal value and freely transferable. The shareholders vote for directors and trustees, the latter usually being necessary because of the lack of legal power of the joint stock company to hold property in its own name. Several of the states have enacted statutes to cover this type of firm, and in New York a joint stock company must file its association articles with the Secretary of State and the county clerk. A firm of this type may sell both common and preferred stock, bonds, notes, mortgages, etc., in order to raise the funds required for its operations. Many of the former large railway express companies were at one time joint stock enterprises organized under the New York statute.

The partnership association is recognized in only four states: New Jersey, Ohio, Michigan, and Pennsylvania. In essence, it is a partnership which is formed under a statutory contract, but which has the proprietorship interests represented by stock certificates freely transferable only with the consent of the other partners. (There must be an affirmative vote of the majority of partners and a majority of shares before the new partner is admitted to full voting privileges. If the transferee does not secure the requisite majority, the association must buy in his shares at an arbitrated price.) A notice of the articles of association must be filed with the proper authorities.[8] In addition, it should be observed that there is a tendency for courts (in states other than the one of formation) to hold that partnership associations are to all intents and purposes merely ordinary partnerships with the attendant legal implications. This last point must be kept in mind where an interstate business is contemplated.

Business trusts are organized either under the common law (in most states) or under special statutes (in very few states). They must be most carefully formed, or the courts will treat them as general partnerships. In fact, some states do, for all practical purposes, consider them partnerships.[9] In any business or Massachusetts trust, there are three parties plus the property of the organization. First, there are the persons who turn the property over to the trustees under a deed of trust arrangement; second, the board of trustees who hold the property and often manage it as well; and third, the beneficiaries who receive the profits from the enterprise. Obviously, the first and third groups may be — and often are — identical. The beneficiaries hold certificates for shares in the trust which are freely transferable.

[8] See Howard, 9 *The Journal of Business of the University of Chicago* 258–279.

[9] For example, Texas. See *Thompson v. Schmitt*, 115 Texas 69. Some states deny them any legal status, e.g., Washington — see *State v. Hinkle*, 126 Wash. 581.

Private business corporations are created by the acceptance by some state of an application for a charter of incorporation. Since all of the states now have general corporation statutes, the application is acted upon by some designated official rather than the legislature. A charter is usually granted if the application is in proper form and accompanied by the necessary fee. As is well known, the ownership of a corporation is represented by stock certificates which are provided for in the charter. These certificates ordinarily may be sold or given away by the owner in whatever manner he desires.[10] The corporate bylaws, which are drawn up by each individual corporation, usually codify the more important working details of both the general law and the charter, and add such details of organization, administration, and business routine as are not prescribed elsewhere.[11] As contrasted with certain of the types of financial organizations discussed above, the corporation is for all practical purposes separate and distinct from the natural persons who are its stockholders and who conduct its transactions. It may therefore own property in its own name and enter into contracts necessary to the transaction of its affairs. The legal status of the corporation has been the subject of much litigation;[12] its comparatively fixed legal position offers a distinct advantage over the joint stock company, the partnership association, and the Massachusetts trust. A final point to be emphasized is that the powers and privileges of a corporation are determined by the statutes of the state under which it is established. Some states are much more lenient in this respect than others; there is also a diversity of laws as to the regulation of corporate activities.

**Seat of authority.** In a multi-owned business enterprise the power to carry on transactions is vested primarily in the owners and secondarily in the agents who represent the owners. The law of agency, however, limits the power of the agent to act in his principal's behalf in many different ways, depending upon the circumstances of the particular case. This makes it rather important that the agency implications of the type of financial organization be understood by the interested parties and the accountant, particularly since the owners in some instances are much closer to the operations of the firm than in other cases. In this section, a brief discussion is given to this matter with special emphasis upon the possibilities of delegating authority in each of the various types of legal organization previously listed.

In an ordinary partnership each partner is a co-owner and a general

[10] For exceptions see Gerstenberg, C. W., *Financial Organization and Management*, Revised (New York: Prentice-Hall, Inc., 1939), p. 125.

[11] For a discussion of the matters ordinarily found in bylaws, see (1937) Montgomery 17–19; and (1933) 8 Fletcher 4166–4211.

[12] See (1927) Ballantine (whole book); and (1933) Fletcher (20 volumes).

agent of the firm. There may be agreements between the partners as to their respective spheres of work and their contract-making ability, but these will not hold as to outside parties in the absence of notice. Ordinarily, the public is under no duty to determine the powers of each partner if some partnership business is at stake. Naturally, if a partner does overstep his authority as provided for in the articles he can be held responsible by the other partners, although this may — and often does — cause the dissolution of the firm. In a general partnership, the relationship to the firm of the individuals composing it is very direct; that is, there are no intermediaries through which the authority must flow. Expressed more succinctly: notice to one partner is notice to all. This feature is of some advantage in a small, closely held concern, but would prove too cumbersome in a large enterprise.

In a statutory limited partnership, contrary rules apply: only the general partners are able to bind the partnership on business matters (assuming that the firm has been properly organized). The limited partner (or partners) has absolutely no authority over the conduct of the enterprise, and must strictly avoid holding out in any way his relation to the firm other than as a limited partner. His name may not be a part of the name of the concern unless his surname was a part of the firm's name before he became a limited partner.[13] In general, the limited partner may do nothing which would prejudice the interests of the creditors of the firm; his authority is held in check for this reason.

In mining partnerships various arrangements are found. In some instances the partnership is concerned with the profits only, in which event one or more of the partners are appointed managers. But even the managing partner cannot legally bind the firm for anything other than mining supplies and labor. The nonmanaging partners in this case have no agency authority at all. In other instances two or more persons may form a mining partnership in which they will be both co-owners and co-agents, having most of the powers and features of an ordinary partnership. The latter type is rather rare as the usual mining partnership provides that the mine is not partnership property.

Syndicates usually provide for the separation of ownership and management, even though in most instances the manager (or managers) may also be a member of the syndicate. The power to contract liabilities and to pay expenses is in the hands of the manager, who, in many cases, is the one that organized the syndicate. If the venture is a success, the manager is paid a commission, and, of course, he also obtains his share of the profits in accordance with the agreed plan. A point to be emphasized is that

[13] This is a provision of the Uniform Limited Partnership Act. See Section 175(1)(b) of the Pennsylvania statute.

the manager has great powers in this form of financial organization, powers which are held to be necessary if the enterprise is to be profitable.

The shareholders of joint stock companies, partnership associations, and corporations elect a small board of directors which manages the firm and directs its policies. Details of the business are handled by officers appointed and removed by the directors acting as a group. The shareholders, incidentally, are not agents of the firm and have no direct authority over its affairs (unless, of course, they are also directors or officers). In the case of large enterprises the advantage of having this delegated and centralized authority offsets to a great extent the increased taxes and governmental regulation imposed on these forms of financial organization.

The management of the business trust is vested in its board of trustees, similar to a board of directors except that the trustees hold the property of the trust or business. The trust indenture names the first group of trustees and this body is self-perpetuating thereafter until the end of the time limit provided. (In most instances, the time limit provided is a long period in order to avoid certain complicating legal questions as to the limited liability of the persons who establish the trust.) When once selected, the board of trustees cannot be ousted unless a court of equity finds that the firm is being grossly mismanaged. This feature constitutes a distinct disadvantage, as the beneficiaries cannot (as in the case of the corporation) elect new directors periodically; they must bear inefficient management in some instances for many years. It should be observed also that the trustees are not agents of the beneficiaries as the latter have deeded the property involved to the trust itself for a term of years. The trustees, therefore, act in their own name; and they may adopt, amend, or repeal any bylaws not inconsistent with the indenture which has established the trust.[14]

**Continuity of existence.** The law of agency provides that an agent cannot delegate his authority without the permission of the principal. This provision is an underlying principle affecting the continuity of existence of business organizations. For example, since in an ordinary partnership each partner is a general agent of the firm, the death or legal incapacity of any single partner technically dissolves the partnership instantly, in spite of any agreements to the contrary. This is one of the disabling features of the ordinary partnership which cannot be avoided; it obviously lends considerable legal instability to this form of financial organization. Very few firms have ever grown to large size while still partnerships. When the concern has shown the ability to carry on indefinitely, some other legal relationship of the owners is generally preferred.

[14] See Hildebrand, 2 *Texas Law Review* 144–145.

In a limited partnership, the limited partners (because of their position as part owners but not co-managers) can sell or assign their interest in the firm without causing its dissolution, unless the agreement is to the contrary.[15] The retirement, death, or legal incapacity of a general partner, on the other hand, causes the dissolution of the enterprise unless the business is continued by the other general partners under an appropriate provision of the certificate which established the limited partnership.[16] Any person to whom the limited partner may assign his interests, however, cannot inspect the books or transactions of the firm unless the remaining partners agree or unless, again, the certificate makes provision for this point. Even though this form of financial organization legally has the possibility of a longer life than the ordinary partnership, in practice the discontinuity of existence feature is still a handicap.

The shares owned by any person in a mining partnership may be sold or transferred to an outsider without the permission of the other members, and without dissolving the firm. Mining partnerships may be organized for either a definite or an indefinite period of time.

At the present time most syndicates are organized for a single deal or undertaking, and their existence is limited by the contract establishing the organization. In some instances the life is terminated even though the project has not been concluded.

Joint stock companies and partnership associations are ordinarily organized for an indefinite length of time, or if an appropriate statute applies, for the time interval provided in that statute. The shares are transferable without causing dissolution, but as was stated previously, the voting privilege in a partnership association must be specifically granted to new transferees of stock.

The business trust cannot be given perpetual life, being limited by a stated number of years in excess of the life of some one or more of the members of the trust. The agreement may be renewed, however; but frequent renewal, besides being troublesome, may cause the courts to hold the beneficiaries liable for the debts of the concern. In most instances the length of life of a business trust is not a deterring factor in its use, since the trust declaration if carefully drawn can be worded to cover a period of time approaching one hundred years, which is long enough for all practical purposes.

Private business corporations are given a definite length of life in the charter, or a perpetual life, depending upon the state statute. But even where a perpetual life is denied, it is a comparatively simple legal process

[15] This is the rule in those 25 states which have adopted the Uniform Limited Partnership Act. See Section 18 of the Act.

[16] *Ibid.*, Section 20.

to renew the charter.[17] In addition, as is well known, the certificates representing the shares of stock of the corporation are freely transferable with only very minor exceptions, such as some extraordinary provision of the charter, in which the shares must first be offered to the corporation before being sold to someone outside.[18]

**Basis of taxation.** The state in which the business originates usually places special organization taxes upon partnership associations and corporations, but does not place such levies upon ordinary, limited, or mining partnerships. Annual franchise or license taxes are also required of most corporations, joint stock companies, and partnership associations.

Federal and state income tax authorities deal with business organizations under only two classifications: partnerships or corporations. Those operating through the medium of managers are treated as partnerships or as corporations, depending upon the legal and equity details of their organization. Doubtful cases are generally handled by holding that the firm is a corporation (for income tax purposes). The importance of the matter lies in the fact that the partnership pays no income tax directly, although it must file a return, while the corporation (or any firm held to be a corporation) must pay a tax based upon the taxable net annual income. Joint stock companies, partnership associations, and business trusts are uniformly treated as corporations by the taxing authorities. Limited partnerships, syndicates, and mining partnerships are classified as partnerships or corporations according to the details of their organization contracts.

**Status and liability of owners.** The points involved under this topic have been touched upon in previous sections, but they will be summarized and expanded upon for the sake of convenience.

Since the proprietors of an ordinary partnership are both co-owners and co-agents of the firm, they have equal rights and duties in regard to the operation of the business and the preparation of adequate records. In the event that the partners have an agreement among themselves as to their responsibilities, such limitations are not effective if outsiders are unaware of them. As to the owners' liability for partnership debts, it is well settled that such liability is unlimited, and that business creditors may in fact collect all of their claims from any one partner if they desire, although legal action must be brought against all the partners in the firm. Internal contracts, which attempt to limit a partner's liability to creditors, have no standing, as most courts hold that if such a limitation is desired, the organization must be a limited partnership and not a general or ordinary partnership.

[17] In a majority of the states, the perpetual provision is in force, and in several other states the term provided for is over 50 years. (1930) Geier-Mautner 736.

[18] See (1940) Dodd-Baker 259–260 for some examples.

In statutory limited partnerships, only the general partners may take a hand in the conduct of the firm, and, as long as this circumstance continues to exist in the individual enterprise, the courts will hold that only the general partners are liable for the debts of the firm; that is, the limited partners are not subject to any claim other than their investment in the firm. Special or limited partners, however, remain owners and not creditors, and as such they must never place themselves in a position where the interest of the outside creditors would be jeopardized. This means that they cannot withdraw their share of the profits or investment if the property remaining in the firm would be insufficient to pay all liabilities.[19]

The owners of a mining partnership usually elect one of their number to be manager to operate the business (transactions limited to those usual to mining), but the owners remain fully liable for any debts incurred by the manager in properly conducting the enterprise. In some instances, a retiring partner will be held liable for debts incurred after his retirement unless the creditors are notified.

The individual owners, as such, of a syndicate have almost no authority as to the conduct of the undertaking. The work is centralized in the hands of a manager and oftentimes the syndicate is given his name. Managers of syndicates must exercise so much of the responsibility associated with the organization that the success or failure of the syndicate is frequently entirely within their hands. The manager need not necessarily be one person. In fact, two or three members of an investment firm may act as managers. In spite of the extreme delegation of power, the owners of the syndicate remain either fully liable or partially liable for the obligations of the enterprise, depending upon the type of syndicate and the organizing agreement.

Owners of both joint stock companies and partnership associations are divorced from the management, which is vested in a board of directors or managers elected by the owners. In the case of the joint stock form of organization, the owners are still subject to a partnership-like liability which covers all the debts properly incurred by the firm during the time interval that the shareholder retained his stock. These shareholders have no authority to bind the firm to contracts and for this reason they sometimes attempt to avoid the unlimited liability feature by giving legal notice to creditors that they will not be bound. The courts, however, have not clearly ruled upon these attempts, and the law on the subject is somewhat muddled. Partnership association members, on the other hand, have no further liability to creditors after payment of the subscription price of their shares. Usually the word "Limited" or the abbreviation, "Ltd.," must be included in the name of a partnership association. In Pennsylvania,

[19] See Section 13(b) of the Uniform Limited Partnership Act.

the word "Registered" must also be added to the name.[20] It may be observed that the partnership association is generally treated as an ordinary partnership outside of the state of organization. For firms doing an interstate business, therefore, this type of enterprise may constitute a definite disadvantage.

The beneficiaries of business trusts have absolutely no managerial power; if the business is not conducted to suit them, there is no way to get rid of the trustees in the absence of bad faith or fraud. The trustees are generally appointed for a long period of years or the courts may rule the trust to be a partnership and the beneficiaries will lose the limited liability they otherwise enjoy. As was stated previously, however, in a few states the beneficiaries have no way to avoid unlimited liability for firm debts. The confused state of the law of business trusts has caused this form of financial organization to be adopted only rarely and with considerable caution.

The duties and rights of stockholders of private business corporations have been the subject of much discussion, court decisions, and statutory legislation. In addition, it is common to find that the several states hold differently on many of the matters of interest. These factors make it rather hazardous to particularize concerning the responsibilities of stockholders, so the following treatment will be kept as general as possible. As a body, the stockholders generally have the right (subject to the vote or written assent of a prescribed majority of the shareholders) to amend the certificate of incorporation and the bylaws, to elect the directors of the corporation, to pass upon the mortgaging or sale of the permanent assets of the firm, to merge or consolidate with another corporation, to reduce the legal capital,[21] and to dissolve the enterprise.[22] Modern legal theorists hold that the powers just listed must be exercised only in good faith and with due regard to the interests of any minority group.[23] Special emphasis is placed upon the fiduciary duty of voting shares in instances where the corporation has both nonvoting and voting stockholders. Courts have held that responsibilities follow the power to vote.[24] As individual persons, stockholders in general have the right to insist upon representative general meetings (at periodic intervals), to inspect the books of account of the corporation when consistent with the best interests of the firm, to share in dividends, to subscribe to additional stock issues (subject to statutory limitations), and to share in any net assets the corporation may have when it is dissolved or liquidated.

Stockholders cannot act in relation to the usual day-by-day business

[20] See Section 245 of the Pennsylvania Statute.
[21] See Chapter 3.
[22] (1939) Ballantine-Lattin, Chapter 6.
[23] Berle, 44 *Harvard Law Review* 1049.
[24] *Bates St. Shirt Co. v. Waite*, 130 Me. 352.

of their firm.[25] Any action taken by them must be only in the form of an assent, request, or recommendation to the duly elected board of directors. It is only in cases of fraud or irregularities in the make-up or actions of the board that the stockholders can step in as the ultimate parties in interest and ratify or reject decisions made by the directors. In most instances no such interference is permitted.[26] This is one reason why most state statutes provide that adequate minutes be kept of the happenings and resolutions of the board of directors. The stockholders would not have any way of knowing what action to take if minutes of the board meetings were not available. In view of the sharp delegation of power by the shareholders to the directors, the latter must at all times exercise their free and honest judgment upon the conditions which arise. The courts will not allow them to bargain away in advance the judgment the law presupposes they will give to the corporate affairs.[27]

The liabilities of corporate stockholders may be twofold: (1) subscription liability, (2) special liability.

1. Subscription Liability. In the absence of fraud a solvent corporation may collect unpaid subscriptions from subscribers to its stock in accordance with the subscription contract terms. This rule has even been reduced to statutory or constitutional provisions in many states. The rule just stated is almost universal in this country in cases where the stock has not been issued or where it is issued as "not fully paid." If there is no governing statute, however, creditors of insolvent firms cannot sue the unpaid-in-full stockholder directly; the common law makes no provision for a direct liability.[28] The usual remedy (in the event the corporation itself refuses to act) in the case of insolvent companies is for the creditors to file a bill in equity. The status of stockholders, on the other hand, who have been issued stock marked "fully paid," when in effect it was watered or bonus shares, is a matter of great dispute among the legal authorities.[29] Under the latter circumstance there are no outstanding unperformed contracts to pay any additional sum; the stock is deliberately and intentionally turned over to the stockholders. As Fletcher states, "there is a distinction not to be overlooked between the liability of stockholders who still owe something upon their subscription contract, and the liability of the holders of stock which was intentionally but falsely and fictitiously issued as fully paid up." [30] Several states have passed statutes providing that such fic-

[25] *Continental Securities Co. v. Belmont*, 206 N.Y. 7.
[26] (1939) Ballantine-Lattin 283.
[27] *Seitz v. Michel*, 148 Minn. 80.
[28] For annotations see 7 *Annotated Lawyers' Reports* 100.
[29] See (1939) Ballantine-Lattin 583–620 for an excellent short treatment of this matter.
[30] (1933) 13 Fletcher 6048.

titious issues are void,[31] while the courts of other states hold that either the corporation or the creditors (of insolvent companies) may collect the unpaid sums under the "uncollected asset" theory.[32] The question of issuing fully paid stock for property or services (about which there may be some doubt as to the valuation) is discussed in Chapter 2. It is sufficient at this point to state that there is considerable conflict among the authorities as to liability, if any, of the stockholder receiving the shares. In most instances only fraudulent transactions will cause any liability.[33]

2. Special Liability. Some states make stockholders of financial corporations (banks, trust companies, etc.) liable for amounts equal to the par values of their holdings in addition to their subscription liabilities. Since the advent of deposit insurance, however, many states have removed the "double" liability on state bank stocks. On July 1, 1937, the statutory double liability of national bank stock was removed.[34] A few states formerly had the same requirement for all domestic corporations, but usually the holders of stock are not now "doubly" liable for the debts of the company.[35]

**Concept of legal entity.** The term "legal entity" is a phrase used to describe the situation where a business enterprise is viewed by the law as being separate and distinct from the owners thereof, and having a personality created either by statute or court decision. The personality referred to is sometimes thought of as being fictitious; the better and modern viewpoint, however, is to think of it as being either factual or real,[36] at least for most business purposes. Two questions are pertinent at this point: (1) Of what importance is this matter to the accountant, and (2) are all the forms of financial organization described in previous sections of this chapter legal entities? The first question is considered at length in the section to follow, but it may be stated here that the attitude and final decision of the accountant (in regard to the handling of many transactions) are frequently colored or even determined by the existence or nonexistence of legal entity.

Considering now the second question, what are the distinguishing features of a legal entity? It is necessary to review the latter in order to have them in mind when the individual types of business organization are discussed in the attempt to determine their status as to the presence or nonpresence of legal entity. The following list gives some of the tests (or qualifying features) to be used in coming to a decision on this important matter:

[31] For example, Colorado and Arizona.
[32] Masterson, 17 *Texas Law Review* 247, 290.
[33] (1937) Bonbright, II, 795. See also *McCandless v. Furlaud*, 296 U.S. 140.
[34] 49 U.S. Statutes 708; 12 U.S. Code Annotated 64a.
[35] (1939) Ballantine-Lattin 24, note 22.
[36] (1933) 1 Fletcher 24.

1. Is legal entityship conferred or based upon the granting of a state charter or some certificate?
2. Is legal entityship conferred or based upon the succession and transferability of ownership elements?
3. Is legal entityship conferred or based upon the ability to sue and be sued in the name of the enterprise?
4. Is legal entityship conferred or based upon ability to hold real property in the name of the enterprise?
5. Is legal entityship conferred or based upon the proposition that the owners are not agents of the firm (unless they are also officers)?
6. Is legal entityship related to limited liability of the owners?
7. Is legal entityship related to multiplicity of ownership?
8. Is legal entityship related to the possible length of life of the business organization?
9. Is legal entityship related to the tort liability of the owners for business acts?
10. Is legal entityship related to the type of taxes that may be levied on the enterprise?

Upon close examination of the legal authorities, it will be observed that the problem of determining legal entityship is tied up with all ten of the above mentioned "tests," and, as if the problem were not already puzzling enough, there is a tendency to treat some of the forms of financial organization as legal entities for a few purposes but not for all.

Except for some limited purposes, the ordinary or general partnership is not at present viewed as a legal entity, but the more widespread adoption of the Uniform Partnership Act may eventually cause the entity concept to prevail. In fact, the earlier drafts of the Act referred to the partnership as being a "legal person"; these words, however, were changed to "association" in the final revision. The word "association" is subject to either interpretation, but has more of a nonentity connotation. In spite of the change just mentioned, the Uniform Act retained the provision (contrary to common law) that a partnership can hold title to real property. Some authorities feel, however, that the latter provision will not be followed in partnership practice.[37] Another instance where the partnership is viewed as a legal entity occurs in connection with the nature of property owned by partners and used in the partnership. A partner's interest in such property is personal and not real; ordinary rules of dower and inheritance do not apply. A deceased partner's estate cannot claim certain chattels or certain pieces of real estate. All this makes the general partnership take on the aspect of a legal entity. Yet there is still a third instance to be considered. Courts of equity in settling insolvent or bankrupt partnerships often refer to the "partnership entity."[38] The whole doctrine and theory

[37] Bays, A. W., *Cases and Materials on Business Law* (Chicago: Callaghan and Co., 1927), p. 856.
[38] (1933) 1 Fletcher 25, note 50.

of marshaling of assets is essentially an entity concept; if it were not an entity concept there would be no marshaling (all claims would be lumped together). Certain decisions of the courts in connection with the income tax law have also implied a legal entityship,[39] but as is well known an ordinary partnership is not taxed as such under the federal income tax law. In summary it may be stated that in law a partnership resembles the individual (one owner) type of enterprise more than it does the corporation. This conclusion must be reached in spite of the exceptions listed above.

The statutory limited partnership comes a little closer to being a legal entity than the ordinary partnership, particularly in those states which have adopted the Uniform Limited Partnership Act. This closer relationship is due to the provision in the Uniform Act which allows the firm to be legally continued upon the assignment or death of any one of the limited partners. This feature within itself, however, does not remedy any of the other nonqualifying (for legal entityship) aspects of the partnership form of organization. Essentially, therefore, this type of enterprise is legally still just an association of individuals rather than a thing apart.

In those jurisdictions which recognize mining partnerships as being a separate type of financial organization, legal entityship is again conferred only for specific purposes. The operation of the mine by the partners is recognized as a distinct business, at least to the extent of allowing the partnership shares to be freely transferable without effecting a dissolution. Partners in this form of organization also have rather limited powers of representation. Except for the two preceding differences, there is not much distinction (as to legal entity) between the ordinary partnership and the mining partnership.[40]

While the law of syndicates and joint ventures is somewhat unsettled, there is even less tendency to treat them as legal entities than in the case of partnerships.[41] For instance, a group of joint venturers cannot be adjudicated bankrupt, contrary to the rule in partnerships, and the doctrine of marshaling of assets does not apply. Property of the venture, however, is partially recognized as being jointly owned, since at least one court has held that a mortgage given by one member of the organization (of his share) is subject to the equities of the other persons involved.[42] In other important features, too, the syndicate or joint venture is treated as a partnership, but taken as a whole this type of enterprise satisfies fewer of the requisites of legal entityship than any other of the forms of financial organization (except the individual proprietorship).

[39] *Helvering v. Walbridge*, 70 Fed. (2nd) 683.
[40] (1938) Crane 86–89.
[41] (1938) Crane 124.
[42] *Twyford v. Sonken-Galamba Corporation*, 177 Okla. 486.

The status of joint stock companies as to legal entityship is dependent upon the state statute, if any, under which the firm is organized and conducted. That is to say, under the common law, joint stock companies were frequently viewed by the courts as being merely large partnerships which had transferable memberships and little owner representation.[43] After the advent of statutory legislation, however, the dividing line has tended to lean toward the corporation viewpoint, although joint stock companies are not corporations unless the statute specifically so states. The term "quasi corporation" is frequently adopted to describe this form of organization, and one court has gone so far as to state that "a joint stock company, whatever else may be said about it, is certainly for most, if not all practical purposes, a legal entity, capable in law of acting and assuming legal obligations quite independent of the shareholders."[44] This last opinion is not shared in full by other authorities, however, especially as to the nature of the "citizenship" of a joint stock company, its ability to hold real estate, and other features. In view of the variety of statutes, it seems preferable to conclude that if all of the corporate attributes exist, joint stock companies are legal entities, but if the essential attributes are lacking they are not legal entities. Under this conclusion very few of these organizations would qualify in full measure; this appears, however, to be the present status of the law.

In so far as legal entityship is concerned, partnership associations are similar to joint stock companies. They usually possess several of the attributes of corporations, but the courts have refused to treat them as legal bodies for all business purposes. They do not, for example, have the privilege of asserting their citizenship for the purpose of bringing themselves under federal jurisdiction in the state in which they are organized.[45] But they do have the right to sue and to be sued, limited liability, and the right to own property in the common name. In Michigan, partnership associations come so close to being treated as corporations that the law governing corporations in that state is applied to them rather than the law of ordinary partnerships (for doubtful points which arise).[46] In the three other states that recognize them, however, the comparison is generally made with the joint stock company.

The various states are divided into two groups when it comes to their treatment of business trusts. In the first group are those jurisdictions which hold that this form of financial organization is essentially a partnership in disguise and thus possesses little legal entityship. In the larger number of states, however, the courts make a close inspection of the trust

[43] (1933) 1 Fletcher 21.
[44] *Hibbs v. Brown*, 190 N.Y. 167.
[45] *Great Southern Fireproof Hotel Co. v. Jones*, 177 U.S. 449.
[46] *Armstrong v. Stearns*, 156 Mich. 597.

indenture, the statutes, and the business behavior of the organization before expressing an opinion as to whether the firm at issue is a partnership or a bona fide business trust. The decision in the latter instance is based upon the control retained by the beneficiaries and the way the trustees are selected. If it is held that the enterprise is a trust, it is in several respects treated as a legal entity, especially for such purposes as litigation, taxation, and formal registration.[47]

The corporate form of organization typifies more fully the concept of legal entity than any other type of business enterprise. In fact, many of the often quoted definitions of corporations contain the words "legal entity" or phrases which mean the same thing. Hundreds of courts have expressed the opinion that the corporation is an entity separate and distinct from the owners thereof, possessing legal rights and liabilities not the same as those of the shareholders taken individually or severally, and that the corporation and its officers do not have the same personality. The corporate entityship is taken seriously and is not lightly disregarded, but it may be (and occasionally is) cast aside if it is necessary to work out some inequities between the parties at interest, or in cases of fraud or violation of public conscience.[48] The legal entityship is held to begin when the corporation comes into existence, and the latter is usually stated in the incorporating statute or in the charter.[49] An interesting question arises in regard to so-called "one-man" corporations (firms with only one shareholder). Do they possess legal entityship? In this connection it may be noted that corporations may be formed in at least two states with just one incorporator,[50] and it is always possible of course for all the stock to be acquired by one person. A very few courts have held that the firm loses its legal entityship in such an event. The general and predominating viewpoint, however, is that the legal entity is unaffected; there may be a closer investigation made of the uses to which the one person puts the corporation, but the corporate powers and privileges are not suspended. In the event that the statutes provide for more than one stockholder, all of them may be "dummies" (except the controlling party) without violating the legal entityship doctrine.[51] Incidentally, all the stock of a corporation may be held by another corporation, a state government, a city, a county, or the United States, yet there will still be a legal distinction made between the enterprise and its owner. Several courts have also held that even though two or more corporations have the same stockholders, directors, and officers, the several entities are preserved. Identical names alone do not disturb the distinction

[47] (1938) Crane 104.
[48] (1939) Ballantine-Lattin 83.
[49] (1933) 1 Fletcher 26.
[50] Iowa Code (1935), Section 8340; Michigan Statutes Annotated (1935), Section 21.3.
[51] See particularly Fuller, 51 *Harvard Law Review* 1373.

of two different companies,[52] but this point may cause the courts to inquire more carefully into the facts of the case.

From what has been stated above it must be concluded that there is no form of business organization that possesses legal entityship for *all* purposes, yet each one of the types discussed has been held in varying degree to contain some of the elements which make it legally distinct from the owners thereof. Of the types listed, the corporation naturally comes closer to satisfying the several tests than any other form of enterprise, while the joint venture is most like the nonlegal-entity individual proprietorship. The other multiple-owned organizations range themselves between the corporation and the joint venture.

**Proprietary and entity theories of accounting.** *Introduction.* There are two possible approaches that one may take in the examination of basic accounting questions and propositions. One of these may be referred to as the "proprietary theory," and the other is generally called the "entity theory." Each of these theories is well rooted in history [53] and each has its several supporters. The differences between the two theories are based for the most part on (1) the nature of the business enterprise, (2) the viewpoint to be taken of the fundamental accounting structure,[54] and (3) relative emphasis to be placed on legal, economic, and accountancy concepts. Present-day accountants should be particularly interested in these theories, since they consciously or unconsciously select one or the other of them in deciding both major and minor questions which arise from time to time. In view of the fact that this process of selection is continually going on, there is small wonder that there are so many disputations in accounting matters. The two theories mentioned do not offer a common meeting ground, and if an accountant is not persistent in holding to one or the other, his conclusions as to matters of interest are likely to be inconsistent and unreconcilable. In addition, if one person holds to the entity theory, for example, in deciding the proper attitude to take on a certain question, and a second person adopts the proprietary theory in making his decision on the same point, the two may argue and discuss for days without reaching a common decision. In a sense, they are simply not using the same language. Their assumptions being different, their viewpoints may be irreconcilable.[55]

*Outline of the two theories.* Before discussing the implications of the two theories further, it may be well to outline the essential underlying tenets of each.[56]

[52] *Owl Fumigating Corp. v. California Cyanide Co.*, 30 Fed. (2nd) 812.
[53] For an excellent historical treatment, see (1933) Littleton 165–203.
[54] (1939) Gilman 48; Hord, 14 *Accounting Review* 272–284; Husband, 12 *The Accounting Forum* (No. 4) 63; (1922) Paton 3–27.
[55] See (1947) Vatter 1–24 for further elaboration of this.
[56] Adapted in part from (1933) Littleton 192–203; (1939) Gilman 47–64; (1935) Husband-Thomas 18.

| | PROPRIETARY THEORY | ENTITY THEORY |
|---|---|---|
| 1. *Primary purpose of accounting.* | Primarily concerned with the accounting by the owner (or owners) for his own property in detail and in total. | Primarily concerned with the accounting to "outsiders" (owners and creditors) for all property entrusted to the business (as an entity), and dedicated to its purposes. |
| 2. *Relation of assets to liabilities and proprietorship.* | Proprietor owns all the assets, but owes certain amounts to creditors. | The business entity owns all the assets; both liabilities and proprietorship are claims against the assets. |
| 3. *Form in which the accounting equation is to be written.* | Assets − Liabilities = Proprietorship | Assets = Liabilities<br>or,<br>Assets = Liabilities + Proprietorship<br>or,<br>Assets = Equities<br>or,<br>Assets = Investments |
| 4. *Nature of capital.* | The owner's contribution to the enterprise, plus the net gains not withdrawn (that is, the net worth of the enterprise). | The sum total of all property (both tangible and intangible) active in carrying out the business or entity purposes. |
| 5. *Source of capital.* | Investment of the owner or owners, plus gains not withdrawn. (Source of property active in the enterprise is important.) | Investment of the owners (plus gains not withdrawn), plus property purchased by incurring short or long term debts, plus leaseholds, plus gifts, etc. (The source of property is not of great importance.) |
| 6. *Distinction between owners and creditors.* | Careful differentiation necessary. | No distinction necessary insofar as the theory is concerned. |
| 7. *Nature of liabilities.* | Liabilities are negative assets — negative properties, which must be sharply defined and separated in the accounting process. | Liabilities considered to be capital sources as much as so-called "proprietary investments." The claims against the assets are so difficult to classify that there is no particular accounting purpose served in making sharp differentiations. Considers such differentiations as being purely legalistic. |
| 8. *Nature of profits.* | Profits are increases in net assets, that is, increases in the net figure of positive and negative properties. | Profits represent an increase in the nonlegal liability of the entity to the proprietor or proprietors due to an excess of recoveries over outlays. The term "net income" is often used. |
| 9. *Importance of source of profits.* | Source is of no particular importance — any increment to proprietorship. Source may include both usual and unusual increments. | Source is of great importance, as only skillfully conducted business operations result in "profits." |
| 10. *Importance of periodicity as to profits.* | Of no great importance. | Amount to be called "net income" for any period is of major significance. Periodicity factor is of greater importance than overall, long term, accretions. |

| | PROPRIETARY THEORY | ENTITY THEORY |
|---|---|---|
| 11. *Relation of expenses to assets.* | Expenses are viewed in somewhat the same way as losses, that is, deductions from proprietorship. Assets and expenses have only a remote relationship. | Expenses and assets are in the same category, that is, profit-making media. The difference between the two is in the time of appropriation in relation to specific units of income. |
| 12. *Nature of assets.* | Assets are objects or realizable claims which are awaiting sale to satisfy creditors. Assets are essentially debt-paying media. | Most of the assets are outlays which have been made for productive reasons. They await appropriation or use for business purposes. |
| 13. *Distinction between owners and the "business."* | No distinction made. The business is not an entity. | Sharp distinction made. The owners and the business are separate; the business is an entity. |
| 14. *Centers of attention.* | (a) Balance sheet values, particularly short-term realizable values.<br>(b) Legal relationships of various parties interested in the firm, that is, ownership and debts.<br>(c) Relation of depreciation to the preservation of capital. | (a) Association of costs and returns from costs.<br>(b) Periodic income reporting.<br>(c) Going-concern valuation concepts, such as depreciation-a-cost-element and the pricing of materials into production.<br>(d) Distinctions between costs, expenses, and losses.<br>(e) Distinctions between operating and nonoperating items. |

*General discussion.* Differences such as the above are real and not just superficial; they strike at the very nature of the accounting process. Both theories were derived more or less independently in attempts to rationalize bookkeeping transactions.[57] They have, however, far greater implications. Legal considerations have been of importance in the logical development of each of the theories.[58] The strict entity theorist views all business enterprises in much the same way as the law views the corporate form of financial organization; that is, a thing separate and apart, having an independent existence. But since (as was explained in the previous section) the law does not confer full legal entityship for business purposes on all forms of organizations, there is a contradiction between the acceptance of the entity theory and the law. The entity theorist (if he is to be consistent) must ignore this contradiction. The proprietary theorist, on the other hand, must in turn pass over very lightly the legal entity aspects of the corporation, as such aspects are contrary to his fundamental viewpoint of the nature of the business enterprise. It appears, therefore, that legal entityship cannot be reconciled fully with either of the accounting theories under discussion. Undoubtedly, though, legal considerations have caused a great deal of discussion of certain types of accounting matters, which discussion and

[57] (1933) Littleton 193; (1947) Vatter 1–25.
[58] (1939) Gilman 51.

dissension perhaps could have been avoided if the contradiction referred to above had not existed.

The entity theory of accounting seems almost inherent in double entry record keeping, and especially in such statements as "the concept of an enterprise as a unit or undertaking for which financial records should be classified and kept, summarized, and interpreted is absolutely essential in accounting."[59] Accountants in general seem to support (at least abstractly) the doctrine that business and private transactions of the owners should be delineated; the confusion of the two often leads to hopeless muddles. This admission would appear to support the entity theory, yet when a situation arises such as a "loan" by a partner to the firm many accountants insist that there is no "liability" to the partner [60] inasmuch as the partner cannot sue the partnership at law for the sum advanced. The same accountants might hold a similar transaction between a corporation and one of its stockholders, on the other hand, as resulting in a liability. Legal truths are made paramount, rather than consistent accounting reasoning.[61] Much damage has been done by the conscious or unconscious shifting of viewpoints (or theories), and a "clearing of the atmosphere" would result if one or the other of the theories were adopted *in toto*. In spite of the appealing nature of the proprietary approach, the entity theory seems better adapted to an explanation of the accounting for modern business enterprises.

*Some implications of the two theories.* (1) One of the important implications of the two theories under discussion is concerned with the problem of whether the accounts of all forms of business organization are to be maintained on a consistent basis. That is to say, are the same concepts of capital, profit, cost, expense, income (periodic), and loss to be maintained in spite of legal authority to the contrary? There has been considerable discussion of this matter in recent years [62] with nothing definite being settled one way or another. Accountants have upon many occasions commented upon the good and bad influences of the law in its relationship to accounting practices and procedures, but there seems no great tendency to disregard legal points of view.[63] Attempts to develop coordinated and integrated structures of accounting theory have been a step in the direction of consistency.[64] It may be several decades, however, before a unanimity of opinion is secured on this matter.

[59] (1936) MacFarland-Ayars 1.
[60] (1940) Montgomery 328.
[61] (1939) Gilman 64.
[62] See Stewart, 65 *Journal of Accountancy* 56; Editorial, 66 *Journal of Accountancy* 281; Hord, 14 *Accounting Review* 284.
[63] For two exceptions see Husband, 13 *Accounting Review* 241–263; Taylor, 16 *Accounting Review* 194.
[64] See particularly (1940) Paton-Littleton (whole book), and the American Accounting Association's "Accounting Concepts and Standards Underlying Corporate Financial Statements," 23 *Accounting Review* 339–344.

(2) A second implication is concerned with the nature and treatment of treasury stock. This particular topic is discussed more at length in Chapter 3, but it may be noted here that there is some conflict between the entity and proprietary theories in regard to the recording and exhibiting of treasury stock.[65] This conflict is present not only in the original acquirement of the stock, but also in its eventual disposal. In many instances, the treatment recommended by the authorities is not consistent with either of the theories; it is frequently an admixture of each, tempered by legal decisions. As mentioned before, this is probably one reason why the topic of treasury stock has given rise to almost endless discussion and controversy. Such discussion has not been fruitless, however, as it has encouraged the development of theoretical considerations.

(3) A third implication is concerned with the relationship of the economic entity to the legal entity in reporting upon the results of the operation of several interrelated organizations. This matter was forcibly brought to the attention of accountants by the Kreuger and Toll case.[66] The point at issue is whether the economic entity is of more significance for accounting purposes than the separate legal entities. One authority insists that the Kreuger and Toll manipulations might very well have been uncovered at a much earlier date if the paramount interest had been in the economic entity viewpoint rather than the legal entity.[67] This is especially true in those cases where the interrelationships are such that the realities of the situation cannot be unearthed without research into the transactions of the integrated units making up the economic entity. The whole matter is of prime importance in connection with the accounting theory and auditing practice underlying the preparation of corporate consolidated statements; it also affords an instance in which the entity theory of accounting is considered to be broader and more comprehensive than the legal entityship of a single business enterprise.[68]

(4) A fourth implication is concerned with the nature of the periodic depreciation charge and the associated accumulated reserve (or provision) for depreciation. Under the proprietary theory, with its emphasis on the balance sheet and valuation, depreciation is primarily related to the "preservation or maintenance of capital" concept, whatever meaning may be given to the latter term.[69] Under the entity theory, on the other hand, the periodic depreciation charge is primarily a cost spreading technique which is essential in the determination of periodic reported net income of the

[65] Husband, 13 *Accounting Review* 250; Hord, 14 *Accounting Review* 280–282; Rankin, 15 *Accounting Review* 75.
[66] Taylor, 16 *Accounting Review* 194.
[67] *Ibid.*
[68] See (1940) Paton-Littleton 9.
[69] For possible meanings, see Bangs, 15 *Accounting Review* 369.

business entity. There is some conflict between these two viewpoints if the preservation of capital is thought of in any other terms than historical-cost-of-depreciated-assets dollars. The latter definition is held by only a comparatively few proprietary theorists. This topic is discussed further in later chapters of this volume.

(5) A fifth implication is related to the question of whether the reappraisal of assets results in a "profit or loss." This depends, of course, upon the viewpoint taken by the respective theorists of the nature of a profit or loss. Under the entity theory, it appears that appraisals do not result in a profit or a loss, since by definition profits and losses are the deliberate result of managing the business entity, and not fortuitous transactions. The proprietary theorist, however, would recognize such items, since profits and losses are changes in the net figure of positive and negative properties. This same conclusion, incidentally, could be drawn in regard to other unusual (nonmanagement caused) gains and losses. A sharp difference arises between the two theories in respect to the whole thinking and reasoning process associated with the accounting for, and the reporting of, so-called "extraneous" or "nonoperating" events in the life of the business enterprise. As has been stated previously, either theory is capable of supporting a consistent body of accounting doctrines or standards in regard to this particular matter. It is only when the two theories are intermingled that confusion may result.

Several other implications could be mentioned, but enough has been indicated to show that the differences between the entity and proprietary theories are deep-seated. Even a casual investigation reveals that the distinctions previously given strike at the very heart of the accounting process. In view of this, it is not surprising to find that satisfactory conclusions on many related accounting matters can be arrived at only by applying consistently either the entity theory or the proprietary theory.

# CHAPTER 2

## Business Capital and Capital Stock

**Concepts of capital — general.** The concept of "capital" has wide application in both accounting theory and practice. Its origin and use as a business term can be traced back for several centuries. During these many decades, the word has naturally taken on several different meanings and connotations in both economics and accounting. Because of the wide variations in possible implications which may be associated with the one word "capital," it is desirable never to use it without a qualifying adjective or phrase. Even though such limitations are employed, there is still considerable room for overlapping in any capital classification scheme adopted. This latter difficulty will become more apparent in succeeding sections of this chapter.

Accountants are in general interested in the following subvarieties of capital:

1. Economic capital
2. Business capital
3. Capital caused by unrealized appreciation
4. Capital realized from non-owners
5. Contributed or invested capital
6. Legal or stated capital

Before discussing each of the varieties of capital listed above, it should be observed that several of them are founded on economic and legal principles rather than accounting. This does not, however, make an understanding of them any less significant to the accountant, and it is for this reason that they are treated in this chapter.[1]

**Economic capital.** Economists have never definitely determined the criteria to be adopted in defining economic capital. A frequently used approach to the problem has been to classify all property into consumer goods and producer goods, the latter being identified with economic capital. Economic capital may also be used in the sense of that part of wealth, accumulated by human labor, which is dedicated to the further production of wealth.[2] Applied to the individual business enterprise, therefore, economic capital represents a definite amount of wealth which has been separated and placed at the disposal of the enterprise to enable it to fulfill its goal of endeavor. This is another way of stating that economic capital

[1] A portion of the following discussion has been abridged from an M.B.A. thesis of Avie Elizabeth Squier entitled "The Accountancy Aspects of Legal Capital" (The University of Texas Library).

[2] Dewing, A. S., *Corporation Securities* (New York: Ronald Press Co., 1934), p. 46.

is reflected in the total of properties (securities investments excepted) active in the business regardless of their source. Capital thus refers to positive *items* of properties (not necessarily their dollar values), and ordinarily, to locate these properties, the economist looks to the left side of the balance sheet.[3]

From the standpoint of usefulness in accounting, the concept of economic capital is fairly limited. It is occasionally used in connection with problems involved in the analysis of financial statements, particularly where percentages based on "total assets" may be advantageously calculated and interpreted.

**Business capital.** As accountants use the term, "business capital" is comparable with "net assets"; the latter is also often called "proprietary capital." The concept of business capital thus includes contributed capital, capital realized from non-owners, and capital caused by unrealized appreciation. An examination of these inclusions reveals that the so-called "outside equities" are omitted in determining the business capital of an enterprise. Under the proprietary theory of accounting, the balance sheet equation is: Positive Properties − Negative Properties = Business Capital, while under the entity theory the equation is: Properties = Outside Equities + Inside Equities (or Business Capital).

The preceding presentation in equation form indicates in definite fashion what accountants understand to be business capital. Its accurate determination, however, becomes difficult on some occasions, especially in connection with the handling of hybrid bond-stock securities issued by certain corporations.

The total of the business capital of an enterprise can be used by accountants in several ways. One of the most significant uses is in connection with the measurement of the earning power of the individual enterprise, such as the percentage that net periodic income bears to business capital. Another use is in calculating the franchise tax or other license tax to do business in certain locations or states.

**Capital arising from unrealized appreciation.** Accountants have been concerned for a long period of years with the question of the relationship of capital to unrealized appreciation due to changing price levels. The problems and theories involved have been given serious attention; some of these are discussed below while others are treated in Chapter 9.

Basically there are three theories regarding unrealized appreciation, namely,

1. Part Capital–Part Income Theory
2. All Capital Theory
3. Surplus Theory

[3] Littleton, 7 *Accounting Review* 293.

In order to facilitate the presentation of these three theories, the following data will be used:

*Example*

A fixed asset, having a depreciation rate of 50 per cent annually, is assumed to have been purchased at the beginning of a fiscal year for $1,000, and during the first year the index of reproduction cost rises from 100 to 225, while the index of general prices rises from 100 to 150.[4]

The suppositions in the example have been purposely exaggerated. The following facts, however, may be ascertained which will be applicable to all three theories:

(a) Replacement cost at end of first year = $2,250

$$\$1{,}000 \times \frac{225}{100}$$

(b) Stabilized expression of the funds originally invested (adjusted to current price level) = 1,500

$$\$1{,}000 \times \frac{150}{100}$$

(c) Depreciated original cost (per straight line method) = 500

$$\$1{,}000 \times \frac{1 \text{ year}}{2 \text{ years}}$$

(d) Depreciated replacement cost = 1,125

$$\$2{,}250 \times \frac{1 \text{ year}}{2 \text{ years}}$$

(e) Depreciated stabilized original cost = 750

$$\$1{,}500 \times \frac{1 \text{ year}}{2 \text{ years}}$$

*Part capital–part income theory.* This is the theory which is particularly supported by the advocates of stabilized accounting.[5] Referring to the above example, the unrealized income (appreciation) by this theory would be ($1,125 − $750) or $375, while the capital would be ($750 − $500) or $250. This theory is based on the assumption that real (purchasing power) capital is the kind of capital to be preserved; that is, appreciation is capital to the extent of the amount required to express in the current general price level the net original cost of the asset, and the remainder is unrealized income.

*All capital theory.* Some authorities have suggested that unrealized appreciation is altogether capital of some type. This view is supported by statements such as the following: "The more one studies the subject, the more one becomes convinced, it seems, that the increment imputed to

[4] Sweeney, 7 *Accounting Review* 115.

[5] Notably H. W. Sweeney (see Chapter 16 for further discussion).

appreciation is in the nature of capital, not surplus. The term 'surplus' is a misnomer and, therefore, should not be used." [6] Referring to the above illustrative example, under this theory, all the so-called gross appreciation of ($2,250 – $1,000) or $1,250 would be capital. The concept of capital, in this sense, is the same as the physical asset itself; it is thus closely associated with the definition of economic capital.

*Surplus theory.* The majority of accountants and business men view unrealized appreciation as a special kind of surplus, measured (according to the above illustrative problem) at ($1,125 – $500) or $625.[7] This theory has extremely wide support among accounting authorities. This is evidenced by the numerous occasions in practice where the credit for unrealized appreciation (if recorded) is made to such account titles as "Surplus Arising from Appreciation," "Revaluation Surplus," "Appraisal Surplus," "Appreciation of Fixed Assets," and "Unrealized Surplus." Incidentally, one authority has described such sums as a margin for the fluctuation of property values, i.e., "Fluctuation Margin." [8]

For many years accountants classified appraisal increases as a part of "Capital Surplus." [9] The use of this term has been criticized in recent times, however, as being misleading and generally erroneous, since it carries no definite meaning.[10] This subject is treated at length in Chapter 11.

**Capital arising from non-owners.** The type of capital acquired by transactions with non-owners has been variously described as Accumulated Capital, Retained Earnings, Margin for Equalization of Dividends, Earned Surplus, Earnings Retained for Use in the Business, Undivided Profits, and Surplus Earnings. While there has always been some doubt as to the exact nature of this kind of capital (as in the case of the types previously discussed), the following outline is presented in order to state what the authors believe to be the essential components of capital arising from non-owners:

COMPONENTS TO BE INCLUDED

1. Ordinary income of the business
2. Gifts from non-owners
3. Remission or cancellation of debts from non-owners
4. Receipts on life insurance policies on lives of officers in excess of cash surrender value (booked) of the policies
5. Annual amortization of appreciation due to depreciation (see Chapter 11)
6. Restorations made to this type of capital when treasury stock is sold, of charges previously made when the treasury shares were acquired

[6] Wildman, 5 *Accounting Review* 44.
[7] Sweeney, 7 *Accounting Review* 117.
[8] Littleton, 7 *Accounting Review* 293.
[9] (1933) Kester 527; Thompson, 60 *Journal of Accountancy* 27–35.
[10] (1947) Langer, Lecture 6, p. 1; Sweeney, 7 *Accounting Review* 117.

COMPONENTS TO BE DEDUCTED

1. Charges caused by the lack of a sufficient amount of contributed or invested capital to absorb all the debits occasioned by the purchase of treasury stock (see Chapter 3)
2. The book value of all property or cash distributed as dividends
3. The par value of all par value shares, or the stated value of all no-par shares (if recorded at stated value) issued as stock dividends. [If the market value of the shares issued as a dividend is used (see Chapter 6), the deduction from Earned Surplus account will usually be for an amount in excess of the par or stated value.] Stock dividends issued in no-par shares not recorded at stated value cause a transfer to contributed capital (see next section) only to the extent determined by the board of directors; [11] some states permit the declaration of stock dividends without any transfer of any type of surplus to contributed capital; [12] other states stipulate that when preference shares are declared as stock dividends, there must be a transfer to contributed capital of an amount equal to the redemption or liquidation price; [13] while still others require the transfer to contributed capital of an equivalent per share of such dividend that equals the average value of like shares previously existing in the Capital Stock account.[14] This topic is discussed further in Chapter 6 on Corporate Dividends.

In concluding this section, it should be observed that the concept of capital acquired from non-owners underlies the accounting for earned surplus; the latter is of major importance in many aspects of corporation accounting.

**Contributed, paid-in, or invested capital.** Invested or contributed capital refers to the total contribution to, or investments in, a corporation by stockholders, past or present, and retained by the corporation.[15] One authority has suggested that the term "Dedicated Capital" would be more expressive.[16] The importance of an accurate determination of the sum of invested capital becomes of paramount significance in connection with the amount legally available for dividends. It is also useful in determining relative "earning power" percentages in statement analysis and interpretation. As in the case of capital arising from non-owners (see preceding section), there is no unanimity of opinion concerning this concept of capital, and according to some accountants the matter is further complicated by bringing into the picture legal viewpoints. With this in mind the following suggested outline is presented in order to have before the student what the authors believe to be the components of invested capital (several of these items are discussed further in Chapters 3 and 4):

[11] For example, see Illinois Business Corporation Act of 1933, Section 41.
[12] Ohio General Corporation Act of 1933, Sections 8623–8638.
[13] California Corporation Law of 1933.
[14] Michigan General Corporation Law, Section 22.
[15] (1936) Marple 3–18; *Accounting Research Bulletin No. 39.*
[16] Littleton, 7 *Accounting Review* 293.

COMPONENTS TO BE INCLUDED

1. The aggregate amount *subscribed* for all unissued but not outstanding shares, whether par value or no-par
2. The aggregate amount subscribed for all outstanding shares
3. The aggregate amount subscribed for all treasury shares, whether par or no-par, after deducting therefrom any charges made to capital arising from non-owners in acquiring the treasury stock (see item 3 below)
4. Additions made from capital arising from non-owners by appropriate resolution of stockholders or directors
5. Gifts from stockholders
6. Amounts retained on forfeited subscriptions
7. Assessments paid by stockholders

COMPONENTS TO BE DEDUCTED

1. Liquidating dividends paid out of invested capital
2. Operating deficits charged to invested capital in quasi-reorganizations (see discussion of "dated surplus" in Chapter 4)
3. Purchase price of treasury stock reacquired, provided such charges do not reduce the balance of contributed or invested capital below the amount assigned to the outstanding capital stock. The purchase price of treasury shares which cannot be charged to contributed capital should be charged to capital arising from non-owners (see Chapter 3 for a more comprehensive discussion of this matter).

The amount due from subscribers is sometimes subtracted from the aggregate amount of stock subscribed when the contributed capital is being computed.[17] The present authors maintain, however, that the subscription price is an asset until paid and should not be deducted in determining invested capital.[18] The amount unpaid is considered a current asset if the intention is to collect in the near future, and as an "other" asset if not so collectible.[19]

A concise meaning of the expression "paid-in capital" has been given by the Executive Committee of the American Accounting Association:

Paid-in capital is measured by the cash, or the fair market value of other assets or services, contributed by stockholders or by persons acting in a capacity other than that of stockholders or creditors, or by the amount of liabilities discharged upon the transfer of an equity from a creditor to a stockholder status. Paid-in capital may be reduced by the redemption or other reduction of outstanding shares, payments of liquidating dividends, or adjustments effected by a corporate reorganization. The reduction of paid-in capital upon the contraction of outstanding

[17] (1938) Taylor-Miller 226; (1938) Bolon 367; Walton, 29 *Journal of Accountancy* 307; (1947) Johnson 438; (1947) Langer, Lecture 3, p. 2.

[18] *See v. Heppenheimer*, 61 Atl. 843; *Coleman v. Booth*, 186 S.W. 1021.

[19] (1932) Finney 224. The view expressed above is not unanimous, however. For example, (1942) Holmes 106 states that subscriptions must be deducted from capital stock if (1) there is no intention of ever calling for the unpaid amount, or (2) if there is a contingency with respect to payment.

shares may not exceed the prorata portion of paid-in capital applicable to the number of shares contracted.[20]

Where an asset is acquired from investors or donors its cost for accounting purposes is fair market value at the time of acquisition.[21]

**Accounts for contributed capital.** The capital contributed by stockholders should be recorded in the accounts for capital stock and paid-in surplus. The recommendations of the Securities and Exchange Commission [22] as to the accounting for paid-in surplus may be followed if three accounts are maintained for paid-in surplus: Paid-in Surplus (From Present Preferred Stockholders), Paid-in Surplus (From Present Common Stockholders), and Paid-in Surplus (Miscellaneous). Each of the itemized debits and credits in the pro forma accounts given below are discussed in detail when the accounting for the related topics is developed in this volume. Paid-in Surplus (Miscellaneous) is not included in the values covered by the phrases "contributed capital pertaining to preferred shares" and "contributed capital pertaining to common shares." [23]

**Paid-in Surplus**

(From Present Preferred Stockholders)

| *Debits* | *Credits* |
|---|---|
| 1. Excess of amount credited to Preferred Capital Stock account over receipts from unissued and treasury preferred stock sold. | 1. Excess of receipts from unissued and treasury preferred stock sold over amount credited to Preferred Capital Stock account. |
| 2. Prorata portion of account balance at acquisition of preferred treasury stock by purchase or non-prorata donations from stockholders. (Prorata means to average over all shares of same issue.) [24] | 2. Reduction in par or stated value of preferred stock. |
| 3. Prorata portion of account balance at conversion of preferred to common shares. | 3. Earned surplus allotted to bring total contributed capital pertaining to preferred shares up to their redemption value. |
| 4. Total credit to account on preferred stock sold on installment basis to defaulting subscribers if subscriptions are declared forfeited. | 4. Prorata portion of account balance pertaining to preferred shares donated proratably by stockholders. |

[20] 23 *Accounting Review* 342 (quoted by permission).
[21] 23 *Accounting Review* 340 (quoted by permission).
[22] Accounting Series Release No. 45 (quoted in full on pp. 101–102).
[23] For an interesting analysis of contributed capital see (1947) Langer, Lecture 6, pp. 2–6, where it is recommended that surplus arising from a readjustment of the capital stock structure of a corporation be differentiated from paid-in surplus and that separate accounts be maintained for Paid-in Surplus (Name of Stock), Paid-in Surplus (General), Recapitalization Surplus (Name of Stock), and Recapitalization Surplus (General).
[24] This may call for an entry debiting Paid-in Surplus (From Present Stockholders) and crediting Paid-in Surplus (Miscellaneous).

**Paid-in Surplus**

(From Present Common Stockholders)

*Debits*

1. Excess of amount credited to Common Capital Stock account over receipts from unissued and treasury common stock sold.
2. Prorata portion of account balance at acquisition of common treasury stock by purchase or non-prorata donations from stockholders. (Prorata means to average over all shares of same issue.) [24]
3. Excess of operating deficit written off in quasi-reorganization over balance in Paid-in Surplus (Miscellaneous) account if shares are par value stock, or no-par stock recorded under stated value method.
4. Total credit to account on common stock sold on installment basis to defaulting subscribers if subscriptions are declared forfeited.

*Credits*

1. Excess of receipts from unissued and treasury common stock sold over amount credited to Common Capital Stock account.
2. Reduction in par or stated value of common stock.
3. Prorata assessments paid by common stockholders.
4. Prorata portion of account balance pertaining to common shares donated proratably by stockholders.
5. Excess of contributed capital pertaining to preferred shares converted into common stock over the amount credited to Common Capital Stock account.
6. Net receipts from sale of common stock donated proratably by common stockholders if only a memorandum entry is made at date of donation. Prorata portion of balance of Common Stock account pertaining to common stock donated proratably by common stockholders if entry is made at date of donation [entry for sale may involve either debit (1) or credit (1) above].

**Paid-in Surplus**

(Miscellaneous)

*Debits*

1. Excess of the cost of reacquired shares over the contributed capital pertaining thereto; shares from prorata donations are excluded from this provision. If the Paid-in Surplus (Miscellaneous) account balance is insufficient, unabsorbed amount must be charged to Earned Surplus account. If desired, the entire excess may be charged to Earned Surplus account.
2. Operating deficit written off in quasi-reorganization should be charged as much as possible against the account;

*Credits*

1. Excess of contributed capital pertaining to shares acquired by purchase or non-prorata donations from stockholders over the cost thereof; no distinction is made between classes of stock.
2. Contributed capital pertaining to shares donated non-proratably by stockholders.
3. Excess of the canceled obligation to issue stock over the credit to Subscribers to Common (or Preferred) Stock account when defaulting subscriber's subscription is declared forfeited.

| *Debits* | *Credits* |
| --- | --- |
| unabsorbed amount should be charged to Paid-in Surplus (From Present Common Stockholders) account if the shares are par value stock, or no-par stock recorded under stated value method, or to No-par Common Capital Stock account if the no-par shares are recorded under consideration-received method. | 4. Cash or market value of property donated by non-stockholders, if such gifts are not designated as a separate kind of surplus as recommended by the present authors (see p. 122).<br>5. When stock dividends are recorded at the market price of the stock issued (see Chapter 6), the excess of the market price over the par value (or the stated value of no-par shares) of the shares issued in connection with the dividend should be credited to this account. |

**Legal or stated capital.** The terms "legal capital" and "stated capital" are synonymous,[25] although the latter is usually associated by the layman with no-par stock. This association is due to the fact that the term "stated capital" first came into use in connection with the permission to credit part of the consideration received and/or receivable for no-par value stock subscriptions to an account other than Capital Stock.

The concept of legal capital originated several decades ago when state legislatures began to consider the possibilities of losses by corporate creditors if there were no limits to which dividends might be paid. It had its beginnings, therefore, in the law of corporations, and today all states have some provision regarding the matter.[26] As in other instances, however, the statutes are not uniform. Accountants have been and are still much perplexed as to the significance of this matter in the accounting process. Most authorities seem agreed that the role of the accountant lies in the direction of adequate disclosure which will assist in making the final legal decisions. Adequate disclosure presupposes, however, a knowledge of desired results; the discussion below is based on this viewpoint.

That the legal capital of a corporation constitutes a fund set apart in trust and pledged for the payment of corporate debts to non-owners, is a view which courts have often taken.[27] Many decisions seem to be based on the presupposition that certain funds of assets can be segregated and labeled. According to the courts, the money and property received for the stock, even patents, are to a large extent tangible in nature. The stockholders' rights in the first instance attach to a fund which can be thought of quite clearly and concretely. In general, therefore, the trust fund theory is based on the idea that rights adhere in specific assets. But the "tangibles" view is not necessary in order to recognize adequately the legal necessities.

[25] (1944) Sunley-Carter 21.
[26] (1944) Sunley-Carter 20.
[27] *Dodge v. Ford*, 204 Michigan 459; *Smith v. Dana*, 77 Conn. 543.

In fact, the trust fund theory is now considered untenable because of the continuous intermingling of assets,[28] making exact identification of their source impossible. In addition the money amount, or value of corporate property, is constantly changing, while, on the other hand, the legal capital does not fluctuate for the same reasons.

A view which appears to the authors as theoretically more tenable and practically more accurate is that which defines or describes the legal capital as a quantum or a "mathematical limitation" below which the assets of a corporation may not lawfully be withdrawn by shareholders.[29] It is an abstract quantity used as a measure of the legal protection of creditors and stockholders and is not that with which the measure is filled.[30] This mathematical limitation can only be changed by statutory procedure.[31] The legal or stated capital, therefore, is not to be diminished by returns to shareholders either in the form of dividends or through the purchase of its own shares by the corporation.

An interesting aspect of legal capital arises in the event of a deficit. In view of what has been stated above, one cannot logically speak of a deficit as an impairment of legal capital, since a mathematical limitation can be changed only by formal action of the authority that determined it in the first instance.[32] But equally certain, that with which the measure is filled has been impaired (that is, the amount of dollars or dollar value which is a protection of creditors and stockholders), but the measure itself has not been disturbed. With the exception of a few states having statutory provisions to the contrary,[33] the legal capital still indicates the amount that must be left in the business after any dividend declaration, and an existing book deficit merely measures the restriction on future profits as a source of dividends, or the amount to be obtained from other sources to absorb such deficit, that is, assessments paid by stockholders.[34] In other words, a deficit measures the dollar requirement to effect an equivalence between the amount of assets and the amount of the liabilities and legal capital. A balance sheet deduction of the deficit from legal capital does not mean, therefore, that the legal capital, in the sense of a mathematical limitation, has been reduced. This treatment of the deficit is simply an accounting technique which more properly discloses a material fact.

In order to have before the student a positive viewpoint as to the de-

[28] Deinzer, 10 *Accounting Review* 338; Smith, 15 *American Accountant* 14.
[29] Hatfield, 58 *Journal of Accountancy* 90; Ballantine-Hills, 10 *Accounting Review* 248; Carman, 61 *Journal of Accountancy* 349.
[30] Lyons, H., *Corporations and Their Financing* (Boston: D. C. Heath and Co., 1938), p. 110.
[31] Marple, 9 *Accounting Review* 75.
[32] Hatfield, 58 *Journal of Accountancy* 90.
[33] Larcom, R. C., *The Delaware Corporation* (Baltimore: Johns Hopkins Press, 1937), p. 132.
[34] Hatfield, 9 *Accounting Review* 237–241.

termination of legal capital as of a definite date, the following digest is presented:

Take the total of

1. The aggregate par value of all par shares subscribed for, *plus*
2. The consideration received and/or receivable for all no-par shares subscribed for, except in states having statutes which expressly provide for the creation of a Paid-in Surplus. The amount of such Paid-in Surplus is determined by
   (a) The excess, if any, of the total consideration received and/or receivable for all no-par shares subscribed for over the aggregate stated value, in states using the stated value method of allocation,
   or,
   (b) The excess of the total consideration received and/or receivable for all no-par shares subscribed for over the amount allocated to stated capital by appropriate action of the board of directors, *plus*
3. Transfers by appropriate corporation action, from one or more of the surplus accounts, either directly or by the issuance of stock dividends, *less*
4. The amount of the stated or legal capital attributed to shares which have been legally canceled or reduced.

From the above digest, it should be noted that the acquisition of treasury shares does not affect legal capital. The possible relationship between legal capital and treasury stock is discussed fully in Chapter 3.

Regarding item 2(b) of the outline above, some of the statutes specify a time limit for the allocation of the consideration to Paid-in Surplus, the entire consideration becoming legal capital if the time limit is not observed.[35]

Other *possible* limitations upon the allocation by the board of directors may be summarized as follows:

1. The stated or legal capital must be at least fifty per cent of the consideration received for the no-par shares. (Michigan Statute)
2. In case the no-par shares have a liquidation preference, the amount of stated capital must at least equal the consideration received for the sale of such shares. (1933 Pennsylvania Law)
3. In case the no-par shares have a liquidation preference, the amount of stated capital represented by such shares must at least equal the amount of such preference. (1933 Illinois Law)
4. A stipulated minimum legal capital must be set up. For example, Alabama, Connecticut, Missouri, Nevada, New Jersey, and New Mexico require that the legal capital cannot be less than $2,000; Maine, Massachusetts, and New Hampshire set the minimum limit at $1,000; while Vermont permits a legal capital of $500 or more.
5. There must be a minimum paid-in legal capital with which to begin business. For example, in Connecticut, Delaware, Illinois, Louisiana, Michigan, Minnesota, Nevada, New Jersey, New Mexico, Tennessee, and West Virginia, $1,000

[35] Delaware General Corporation Law, 1929, Ch. 135; Illinois Business Corporation Act, 1933; and others.

must be paid in; some states set the minimum at a certain percentage of the capital stock, which varies from ten per cent in Georgia to fifty per cent in Texas.

6. Ordinarily, if both par value and no-par value shares are issued, the legal capital must be larger than the par value of the par shares issued. This provision supposedly would allow some legal capital to be associated with the no-par shares.[36]

*Legal capital — Summary.* In view of what has been stated above it is obvious that accountants are not in agreement regarding the display of legal capital on the balance sheet. One group insists that the statutes merely prescribe what a corporation legally may do, and that they do not prescribe the manner in which the corporation shall present what it has already done. This group further contends that the balance sheet is intended to show the results of the transactions that have taken place, and the present position. In other words, balance sheets are financial rather than legal exhibits.[37]

The viewpoint of the second group has been expressed as follows:

> Accountants as a whole fail to recognize that "capital" — "legal capital," . . . is a dollar amount defined and fixed by the statute and not a different name for net worth, proprietary interest, or capital stock. Legal capital is the rule by which surplus must be measured, and accountants who neglect or refuse to follow a legal course from that rule must take the responsibility of placing their clients and themselves in jeopardy.[38]

The advocates of the first viewpoint support their contention that there is no good reason for carrying the stated or legal capital as a separate item from paid-in surplus on the balance sheet, because the balance sheet should reflect financial facts, and the fact of importance in regard to the capital is the amount paid in as fixed capital. This treatment has been modified somewhat by stating that the balance sheet should include some information relative to legal capital, suggesting that this could be accomplished quite well by a parenthetical note without disturbing the usual structure of the statement.[39]

Accountants supporting the second theory state that it is simply an ingenuous defense to take a position that a book or balance sheet deduction from legal capital is not the kind of reduction of legal capital which is prohibited by law.[40] Two criticisms may be leveled at this contention. First, if stated or legal capital is a measure or limitation fixed by statute, no mere figure written on one side of the balance sheet rather than the other

[36] (1944) Sunley-Carter 24.
[37] Thornton, 56 *Journal of Accountancy* 153; Bowles, 58 *Journal of Accountancy* 99.
[38] Hills, 57 *Journal of Accountancy* 473.
[39] Hurdman, 39 *Journal of Accountancy* 17; Wildman, 13 *American Accountant* 20.
[40] Hills, 57 *Journal of Accountancy* 210.

can affect that which the statute has ordained, and hence does not run counter to a prohibition. The other criticism is that the position referred to, rather than being a sign of ingenuousness, is an indication of refinement in regard to accounting technique.[41] It is obvious that most of this conflict of opinion is due to a lack of an accurate understanding of the meaning and accounting significance of legal capital.

In order to illustrate the contrast between the two viewpoints as to legal capital, the following illustration is presented:

*Illustration*

A corporation started business with a stated capital represented by 1,000 shares of stock with a par value of $100 a share, and in the course of its first year's business operated at a loss of $10,000, having in the meantime borrowed $15,000 on notes payable.

(a) Under the dollar-value conception of legal capital, the only balance sheet display of the facts which would not perform a prohibited act would be:

| | | | |
|---|---|---|---|
| Assets | $105,000 | Notes Payable | $ 15,000 |
| Deficit | 10,000 | Legal Capital | 100,000 |
| | $115,000 | | $115,000 |

(b) Under the mathematical limitation concept of legal capital, the facts could be displayed as follows without performing a prohibited act:

| | | | | |
|---|---|---|---|---|
| Assets | $105,000 | Notes Payable | | $ 15,000 |
| | | Legal Capital | $100,000 | |
| | | Less: Deficit | 10,000 | 90,000 |
| | $105,000 | | | $105,000 |

This latter display indicates that the legal capital, in the sense of a mathematical limitation, has not been reduced. On the other hand, it is equally certain that the amount of dollars has been reduced. For this reason, the mathematical limitation concept seems preferable to the authors.

**Capitalization defined.** The term "capitalization" is often used to refer to the sum of the business capital and outstanding funded (bonded) debt. While this is the meaning attributed to the word by the accountant, banker, or financial consultant, the lawyer may use the term to refer to the issue of stock, common and preferred, outstanding at any time. "Capitalization" has some accounting significance, and is popular in statement analysis and interpretation.

**Kinds of capital stock.** *As to par value.* Corporate stock may be par or no-par as the promoters request in the charter. The first no-par stock law in the United States was passed in 1912, and no-par stock soon became very popular, especially in the 1920's. Since 1930, however, there has been a marked tendency toward the adoption of a nominal par value — $1 to

[41] Hatfield, 58 *Journal of Accountancy* 91.

$5 — in order to save a portion of the incorporation and transfer taxes (several jurisdictions tax no-par shares as if they had a par of $100).

*As to status.* The total capital stock permitted to be issued by the charter is the authorized capital stock. This authorized stock should be shown on a balance sheet either in the account title or as the minuend from which the unissued and treasury stock should be subtracted in order to show the outstanding stock as the significant figure. The unissued stock may be either unsubscribed stock or subscribed stock, with the latter being part of the legal capital. Treasury stock is fully paid issued stock which has been reacquired by the corporation. As observed on a previous page, the acquisition of treasury shares does not reduce the legal capital of the corporation. Outstanding capital stock, if fully paid, is usually non-assessable although a few states permit the issuance of assessable capital stock. The statutes do not prohibit, however, the holders of stock from making voluntary donations to the corporation, either in proportion to their holdings or otherwise.

A few terms such as "donated," "forfeited," and "bonus" stock, do not represent basic kinds of stock. For example, donated stock is treasury stock reacquired by gift rather than by purchase. Forfeited stock should be referred to as forfeited stock subscriptions rather than forfeited shares. Bonus stock, on the other hand, is ordinary outstanding common or preferred shares, the issuance of which serves as a partial inducement for the sale of a different class of corporate security, such as issuing as a bonus one share of common stock for every ten shares of preferred subscribed.

*As to voting.* All shares have equal voting powers, on a per share basis, in the absence of expressed stipulations to the contrary. A very few states, such as Mississippi, prohibit the issuance of nonvoting shares, but in general capital stock may be either voting, nonvoting, or restricted voting. Unless the voting features are unusual, accountants do not detail them on the balance sheet. Examples of out-of-the-ordinary voting features are (1) preferred stock voting and common stock nonvoting due to dividends in arrears on the preferred, and (2) voting trust certificates issued to stockholders in lieu of their regular certificates.

*As to cumulative dividends.* In most jurisdictions, preferred stock has the privilege of cumulative dividends in the absence of express stipulations to the contrary. In modern times, however, this matter is of little importance since preferred stock contracts nearly always state that the shares are cumulative or non-cumulative. From the standpoint of popularity, dividends on railroad preferreds are for the most part non-cumulative, while in the industrial and public utility fields the preferreds are overwhelmingly cumulative.[42]

[42] Raisty, L. B., "Preferred Stock" (Ph.D. thesis, The University of Texas Library).

*As to participating dividends.* Unless otherwise expressly provided, the preferred stock participates equally with the common as to earnings.[43] Some courts, however, have held the contrary view.[44] In practice the preferred stock contract usually makes the shares non-participating. If participation is provided, it may be either full or partial.

*As to assets in liquidation.* Unless otherwise expressly provided, preferred stock is generally held to be non-participating as to assets in liquidation.[45] The usual preferred contract provides, however, that the shares shall have preference on liquidation, but limits this participation to the stated redemption value of the stock plus cumulative dividends in arrears. The fact that dividends were not earned does not affect the priority of passed cumulative preferred stock dividends over the par value of the common stock; [46] this point is important as a few authorities imply that the cumulative dividends in arrears can be paid at liquidation only if sufficient earnings have been accumulated to cover the unpaid amount.[47] Redemption premiums cannot be paid unless there are sufficient profits earned out of which to pay them.[48]

Most accountants at the present time consider it highly desirable to state on the balance sheet the preferences, if any, of the preferred stocks in the event of involuntary liquidation. This is particularly appropriate if the preference is other than par or stated value.[49]

*Debenture stock.* The term "debenture" in the United States usually means an unsecured bond. There have been a few instances, nevertheless, of debenture stock; they are essentially preferred stock, however, and have been given the name "debenture" for some special reason.

*Deferred stock.* Shares which do not receive any dividends until after dividends have been paid on one or more other classes of shares are called "deferred stock." Promoters' shares, founders' shares, and management shares are examples of deferred stock. These shares may be issued in order to give certain parties or groups a greater than usual proportion of the profits if the enterprise is successful. Deferred stock is not popular in this country.

*Guaranteed stock.* Shares of stock are referred to as being "guaranteed" if a party other than the issuing corporation endorses each certificate, giving the individual stockholders the right of legal action against the

[43] *Englanders v. Osborne*, 261 Pa. 366; *Sternbergh v. Brock*, 24 L.R.A. (N.S.) 1078; *Fidelity Trust Co. v. Lehigh Valley R. Co.*, 64 Atl. 829.

[44] *Scott v. B. and O. Ry. Co.*, 49 Atl. 327.

[45] *Stone v. U.S. Envelop Co.*, 13 A.L.R. 422.

[46] *Pennington v. Commonwealth Hotel Const. Co.*, 151 Atl. 228, 155 Atl. 514; *Fawkes v. Farm Lands Inv. Co.*, 297 Pac. 47; *Page v. Whittenton Mfg. Co.*, 97 N.E. 1006.

[47] *Michael v. Cayey-Caguas Tobacco Co.*, 190 N.Y. App. Div. 618, 180 N.Y. Supp. 532.

[48] (1943) Paton 1013.

[49] The Securities and Exchange Commission (Accounting Series Release No. 9) requires this of all registrants.

guarantor in the event of default on dividends or liquidation deficiencies.

**Subscriptions to corporate stock.** A stock subscription may be defined as a "contract by which the subscriber agrees to take a certain number of shares of the capital stock of a corporation, paying for the same, or expressly or impliedly promising to pay for the same." [50] Like nearly all definitions, this one is only partially satisfactory, and is subject to many legal interpretations.[51] Unless otherwise provided, a subscriber becomes a stockholder with the right to vote at corporate meetings, or to share in the distribution of dividends, when his subscription has been accepted by the corporation, even if he has not paid the subscription price and/or the stock certificate has not been issued to him.[52]

In a majority of states, subscriptions for stock can be revoked at any time before the offer is accepted by the corporation. An interesting question arises, however, in connection with pre-incorporation subscriptions, since the corporation has not legally come into existence. The general rule is that pre-incorporation subscriptions can be withdrawn by the subscriber by a timely notice to the proper party.[53] The problems of what are "timely notices" and "proper parties" are highly technical and many courts have disagreed on the matter. In a few states, one of them being Texas, a contrary view of the privilege of revoking is held,[54] and bona fide subscribers are held to their contracts unless a mutual release is secured. There seems to be much need for statutory legislation to help settle the issue; several states have made efforts in that direction by enacting laws which make the subscriber liable for his subscription for some period of time (usually one year).[55]

Subscriptions mentioned in the charter are automatically accepted when the charter is issued by the state. Other subscriptions, however, must be formally accepted at some meeting of the board of directors.

Since corporations have no authority to increase the number of their shares of stock without securing an amendment to the charter, subscriptions for shares in excess of the number authorized are without consideration and are void, unless provision (or an understanding) has been made for an allotment or apportionment of the available shares between the various subscribers.[56] It may be noted, too, that where oversubscriptions are merely offers to parties (promoters) appointed to organize the cor-

[50] (1933) 4 Fletcher 1363.

[51] For excellent short treatments of this topic, see (1940) Dodd-Baker 772–800; (1939) Ballantine-Lattin 310–328.

[52] *U.S. Radiator Corp. v. State of New York*, 208 N.Y. 144.

[53] *Collins v. Morgan Grain Co., Inc.*, 16 Fed. (2nd) 253.

[54] *Coleman Hotel Co. v. Crawford*, 3 S.W. (2nd) 1109.

[55] See the corporation statutes of Louisiana, Washington, and Idaho. Minnesota, Illinois, Pennsylvania, and Michigan have also partially settled the point at issue.

[56] (1940) Dodd-Baker 833.

poration and the corporation does not accept the excessive subscriptions (after receiving its charter), the legal effect on the corporation is nil.

The acquisition of issued shares from a stockholder and of treasury stock directly from the corporation are purchases of stock and not subscriptions. In most states the subscription price per share usually must be at least the par value (for stock having a par value),[57] unless the corporation is in a poor financial condition and the stock cannot be sold for par. The subscription price for no-par stock is fixed by resolution of the board of directors; this price may be varied to suit the market, although a few states have a minimum price requirement or other exceptions.[58]

It is rare that the subscription price must be paid in full at one time; in most cases the statutes allow payment to be postponed. Many types of postponed payment plans have been devised and the board of directors of the corporation has considerable latitude in making the calls for payment effective. This subject is discussed further in a later section of this chapter.

**Stock certificates — accounting aspects.** From a legal viewpoint, a stock certificate is not the capital stock itself, but is the evidence of the ownership of the number of shares specified on it.[59] Many persons consider as synonymous actions, however, the issuance of stock and the issuance of the certificate. The important point to be considered in the accounting is the fact that the acceptance of the stock subscription makes the subscriber a stockholder (in the absence of statutes to the contrary). This means that while each stockholder is entitled to a certificate as written evidence of his ownership of a certain amount of capital stock, actual possession of a certificate is not necessary to complete ownership, nor is it essential to the existence of the corporation. In short, the ownership of corporate stock is a matter of record on the books of the corporation, and the stock certificates are merely secondary evidence of ownership. There are, however, certain statutory amendments to this general rule. In Pennsylvania, for instance, the corporation law provides that subscribers who are in arrears on any installment payment of their stock cannot vote the stock.

A large majority of the states require that a corporation chartered under their laws maintain a stock certificate book, a stockholders' ledger and a transfer journal. For a small corporation, these books are usually kept by the secretary of the corporation. In the case of large concerns, some trust company or bank is appointed to act as the transfer agent, while some other bank is selected as registrar; this is done to prevent the issue of stock

[57] For exceptions, see (1938) Sanders-Hatfield-Moore 127; Bonbright, 25 *Columbia Law Review* 408.

[58] See (1940) Dodd-Baker 1001–1014 for a more comprehensive statement.

[59] (1944) Sunley-Carter 32.

above the authorized amount and to insure regularity in the handling of transfers between stockholders. Some stock exchanges, such as the New York Stock Exchange, require that all listed corporations maintain a registry office in the city in which the exchange is located, and that the registrar not be the same concern as the transfer agent.

From a procedural viewpoint, the various steps involved in making a transfer of a certificate from one owner to another may be outlined as follows: (1) When a certificate is to be transferred, the transferor signs the assignment form printed on the back of the certificate; (2) the signature (if not known by the transfer agent) is guaranteed (usually by a bank or trust company); (3) the transferor places on the certificate, or on the memorandum of sale of the stock, the transfer tax stamps required by statute; (4) the transfer agent cancels the old certificate, issues and countersigns the new certificate or certificates, records the transaction in the transfer journal, and posts the entry to the stockholders' ledger; (5) the registrar then examines the old certificate to see that it is genuine, signs the registrar's certificate (usually printed at one end of the certificate), records the transaction in the registration record (drawn up to prevent overissues of stock) and returns all the certificates to the transfer agent; and finally, (6) the transfer agent delivers the new certificate or certificates to the new owners. In case a shareholder sells or gives up only a portion of the stock represented by his certificate, the procedure is substantially the same as outlined above, except that he receives back from the transfer agent a certificate for the shares retained.[60]

**Original opening entries for par value capital stock.** When a new corporation secures its charter and begins to sell stock, there are several satisfactory alternative procedures which may be used for opening the corporate books. The entries to be made vary depending upon (1) whether the stock is par or no-par, and (2) whether there is more than one class of stock to be issued. Par stock issues will be treated first in the discussion below.

The authors recommend that the following entries be made to record the authorized stock and its later issue:

Entry No. 1

| | | |
|---|---|---|
| Unissued Common (or Preferred) Stock | $.... | |
| Common (or Preferred) Stock Authorized | | $.... |

To record the par value of the stock authorized in the charter. (If there are two classes of stock, two entries should be prepared, with the appropriate specific titles in each.)

[60] For a complete discussion of stock transfers see Crow, W. H., *Formal Corporate Practice* (New York, Burrell-Snow, Inc., 1931), pp. 1288–1309; Conyngton, T., Bennett, R. J., and Conyngton, H. R., *Corporation Procedure* (New York, Ronald Press Co., 1927), pp. 416–451.

Entry No. 2

| | | |
|---|---|---|
| Subscribers to Common (or Preferred) Stock | $.... | |
| Common (or Preferred) Stock Subscribed | | $.... |

To record the subscriptions to stock recorded on the subscription lists.

Entry No. 3

| | | |
|---|---|---|
| Cash | $.... | |
| Subscribers to Common (or Preferred) Stock | | $.... |

To record the cash received on stock subscriptions.

Entry No. 4

| | | |
|---|---|---|
| Common (or Preferred) Stock Subscribed | $.... | |
| Unissued Common (or Preferred) Stock | | $.... |

To record the issue of the stock certificates.

The entries given above are recommended for four reasons: (1) The unissued stock is shown on the books; (2) the usual practice of not issuing stock until fully paid is recognized; (3) the distinction between unissued and unsubscribed stock is clearly drawn; and (4) each of the four sections clearly records a specific part of the procedure of organizing the corporation. This division of the entries is also useful because it enables the complexities involved in the opening entries to be classified according to the division affected.

The transactions which occur after the charter is obtained have no effect on the first entry (assuming no additional stock is authorized), and only affect the fourth entry by changing the number of shares issued. The complexities of corporation finance, however, do change the second and third entries. These variations are discussed separately below.

*Complexities affecting second entry.* The second entry is affected by the following cases:

1. Sale of only a portion of the authorized stock
2. Sale of the stock at a discount
3. Sale of the stock at a premium
4. Sale of preferred stock with a bonus payable in common stock

*Case 1.* The sale of only a portion of the authorized stock merely reduces the figures in the second, third, and fourth entries. When a balance sheet is prepared, the Unissued Stock account is shown as a deduction from the Authorized Stock account.

*Case 2.* A very few states permit par value stock to be sold at a discount. If the stock is sold at a figure less than par, the effect of the discount is to reduce the amount debited in the second entry to the Subscribers to Common (or Preferred) Stock account, to allow for the added debit to the Discount on Common (or Preferred) Stock account, or the Paid-in Surplus

(from Present Stockholders) account. The amount of money in the third entry is also reduced since the full par value is not collected from the subscribers. When a balance sheet is prepared, the amount of the discount is treated as an offset to the par value of the outstanding stock,[61] or as negative paid-in surplus. Such discount should be shown separately for each class of stock issued at a discount. Other aspects of this matter are treated in Chapter 4.

*Case 3.* The sale of stock at a premium increases the amount to be debited in the second entry to the Subscribers to Common (or Preferred) Stock account, to allow for the added credit to the Premium on Common (or Preferred) Stock account, or the Paid-in Surplus (from Present Stockholders) account. The amount of money in the third entry is also increased. When a balance sheet is prepared, the amount of the premium is treated as an addition to the par value of the outstanding stock, or under the title "Paid-in Surplus." As in the case of discount, the premium should be shown separately for each class of stock.[62]

*Case 4.* When one class of stock is given as an inducement to sell another class, the shares given are referred to as "Bonus Stock." Instances of the issue of bonus stock have become rare in recent years. Moreover, in most cases the stock given as a bonus is treasury stock, rather than unissued shares. This is particularly true if the sale in blocks is to yield less than the combined par value of both classes. It is doubtful if the bonus stock could otherwise be issued without liability on the part of stockholders as against creditors.[63]

As to the accounting treatment of bonus stock comprised of unissued shares, the suggestion is sometimes made that a Bonus Stock (debit) account be set up to record the par value of the shares issued as bonus. This account is treated as an offset to the capital stock outstanding on the balance sheet. The more widely recommended procedure, however, is to divide the total selling price between the two types of stock being issued in proportion to their relative market prices, thus recording a discount on each class in the ordinary par stock case. If bonus stock is issued with bonds, the discount to be recorded should be allocated between the stock and the bonds according to the discounts on the two types of securities if they had been sold separately.

The use of treasury stock as a bonus is treated in Chapter 3.

*Complexities affecting third entry.* The third entry given at the first of this section is affected by the following cases which do not affect the second entry:

[61] Paton, 57 *Journal of Accountancy* 113.
[62] Sanders, 9 *Accounting Review* 215; (1943) Paton 1001.
[63] (1937) Montgomery 558; (1926) Reiter 94.

1. Partial payment of a subscription
2. Non-cash payment of subscription
3. Incorporation of a partnership or individual proprietorship
4. Installment payment on a subscription:
   a. Fully paid
   b. Not fully paid
      (1) Stock forfeited
      (2) Sold under a lien

*Case 1.* The partial payment of a subscription would reduce the cash involved in the third entry, and would postpone the fourth entry for the time being, unless the stock is issued before it becomes fully paid.[64] The Subscribers to Common (or Preferred) Stock account is an asset of the corporation — a receivable due upon demand unless the subscription contract provides for installment payments. If the Subscribers account is to be collected in the near future, it should be classified as a current asset on the balance sheet; otherwise it should be listed among the "other" assets.[65]

*Case 2.* Noncash payments for stock affect the third entry because the assets received, i.e., Patents, Land, Buildings, Organization Costs, and the like, are debited to the proper account title. The question of the valuation of these assets is discussed on page 54.

*Case 3.* While the incorporation of a partnership or individual proprietorship could be considered as an illustration of a noncash payment of subscriptions, a special technique may well be used which divides the third entry into three parts as follows (only a few illustrative assets and liabilities are given) (see Chapter 11 for a discussion of the tax basis of plant and equipment assets taken over by a corporation):

Part No. 1

| | | |
|---|---|---|
| Cash | $.... | |
| Accounts Receivable | $.... | |
| Inventories | $.... | |
| Goodwill | $.... | |
| Reserve for Doubtful Accounts | | $.... |
| A and B, Vendors | | $.... |
| To record assets received. | | |

[64] Some states allow certificates to be issued stating that they are partially paid, e.g., Delaware, New York, Tennessee, Massachusetts, California, and Florida. Other states forbid the practice, e.g., Minnesota, Illinois, and Pennsylvania. See (1944) Sunley-Carter 33–35.

[65] As noted on a previous page, one writer, however, has stated that the Subscribers account must be shown as a deduction from outstanding stock if (1) there is no intention of ever asking the subscribers for the unpaid balance, or if (2) there is some indefiniteness about the payment, such as payable out of dividends declared on the stock. See (1942) Holmes 106.

Part No. 2

| | | |
|---|---|---|
| A and B, Vendors | $.... | |
| Notes Payable | | $.... |
| Accounts Payable | | $.... |
| To record liabilities assumed. | | |

Part No. 3

| | | |
|---|---|---|
| A and B, Vendors | $.... | |
| Subscribers to Capital Stock | | $.... |
| To close the A and B, Vendors account. | | |

NOTE. Common or preferred stock, or a mixture of both, may be issued to the partners, or individual proprietor. This widely used journalization technique has a very positive advantage whenever the closing entries of the partnership are required along with the opening entries of the corporation. The closing entries for the partnership may well be divided into five divisions, as follows (preceding illustration continued):

Division No. 1

| | | |
|---|---|---|
| Goodwill | $.... | |
| Reserve for Doubtful Accounts | | $.... |
| A, Capital | | $.... |
| B, Capital | | $.... |
| To record possible revaluations agreed upon; the revaluation loss or gain is usually shared in the ordinary profit and loss ratio but the partners may decide upon another ratio. | | |

Division No. 2

| | | |
|---|---|---|
| AB Corporation, Vendee | $.... | |
| Reserve for Doubtful Accounts | $.... | |
| Cash | | $.... |
| Accounts Receivable | | $.... |
| Inventories | | $.... |
| Goodwill | | $.... |
| To record the assets turned over to the corporation. | | |

Division No. 3

| | | |
|---|---|---|
| Notes Payable | $.... | |
| Accounts Payable | $.... | |
| AB Corporation, Vendee | | $.... |
| To write off the liabilities assumed by the corporation. | | |

Division No. 4

| | | |
|---|---|---|
| AB Corporation Stock | $.... | |
| AB Corporation, Vendee | | $.... |
| To record the shares received from the vendee. | | |

Division No. 5

| | | |
|---|---|---|
| A, Capital | $.... | |
| B, Capital | $.... | |
| AB Corporation Stock | | $.... |
| To close out the capital accounts, and record the delivery of the stock to the partners. | | |

*Case 4a.* When stock subscriptions are not all payable at one time the third entry recording the collection is divided into two parts as follows (assuming three calls are to be made for the amount subscribed):

Part No. 1

| | | |
|---|---|---|
| Call No. 1, May 1 | $.... | |
| Call No. 2, June 1 | $.... | |
| Call No. 3, July 1 | $.... | |
| Subscribers to Common (or Preferred) Stock | | $.... |
| To set up the installment call accounts. | | |

Part No. 2

| | | |
|---|---|---|
| Cash | $.... | |
| Call No. 1, May 1 | | $.... |
| To record the collection of Call No. 1; the collection of the other calls would be recorded similarly. | | |

The collection of stock subscriptions in installments does not affect entries No. 1, No. 2 or No. 4, given at the first of this section.

The procedure in Part No. 1 above is desirable when the dates of the calls have been prearranged, as the account titles give the necessary data as to the liquidity of the accounts necessary for the preparation of the balance sheet. However, if the dates of the calls have not been prearranged, Part No. 1 should be modified so that the Call accounts are set up out of the Subscribers to Capital Stock account as the calls are made by the board of directors. The Call accounts should be shown as current assets on the balance sheet, if they are due within the next several months. If not so due, they are classified as "other" assets.

*Case 4b. Forfeited subscriptions not sold under lien.* Forfeitures on stock subscriptions occur when a subscriber defaults on a call for his unpaid balance. As previously noted in this chapter, however, legal capital arises as soon as the subscription contract has been completed, and the capital stock accounts should show the full legal capital represented by all shares subscribed for, including partially paid shares at the date of the forfeiture.

The state statutes vary considerably as to the legal procedures involved in the handling of forfeited stock subscriptions. One type of forfeiture merely involves a transfer of stock from one subscriber to another without any change in the legal capital of the corporation. The type of forfeiture which does affect the legal capital is that which results in the forfeiture of the stocks to the corporation either at the end of a period of grace allowed past-due subscriptions, or in default of a bid for shares

offered at auction.[66] Under the laws of this second type, the following results [67] are attained:

1. The stock and all payments made therefor are forfeited to the corporation.
2. The forfeited shares return to the status of unissued and unsubscribed stock.
3. The legal capital is reduced by the amount represented by the forfeited shares.
4. Any payments which have been received from the subscriber become
   a. Paid-in Surplus (unavailable legally for dividends) in case of par value shares in states prohibiting the payment of dividends from paid-in surplus.
   b. Paid-in Surplus (available for dividends) in case of par shares in states permitting the payment of dividends from paid-in surplus.
   c. Capital Stock, No-par Value, in case of no-par shares in states requiring the entire consideration received and/or receivable to be designated as legal capital.

Although forfeited shares in possession of a corporation are sometimes treated the same as treasury stock (under the theory that a person becomes a stockholder as soon as legally enforceable subscriptions have been received by the corporation), treasury shares (until legally canceled) are still issued and may be sold at any price. Forfeited shares return to the status of "unissued" stock, in the opinion of the present writers. Some authorities disagree, however, as indicated by the following quotation:

> Shares bid in by the issuing corporation for the purpose of resale are properly recorded as treasury stock, under a suitable account title such as Treasury Stock from Unpaid Subscriptions. As generally the legal capital of the corporation must not be impaired by such a purchase, earned surplus or, if such is not available, . . . paid-in surplus . . . should be restricted in the amount of the charges assumed by the corporation in connection with the purchase. . . . On the balance sheet, treasury stock from unpaid subscriptions may be shown as part of the stock issued but under separate heading. If there is no intention to resell the share bid-in, an account Retired Subscriptions may be charged instead of Treasury Stock. As long as the corporation's legal capital has not been reduced, such retired subscriptions may be shown on the balance sheet as part of the stock subscribed, under separate heading.[68]

As to the price at which forfeited shares may be sold, there is some conflict of opinion. Some accountants state that par value forfeited stock must be sold for an amount which when added to that previously received for it will at least equal its par value.[69] An opposite view is that when forfeited stock takes the status of authorized and unissued shares, it cannot be sold for any amount which would not be legal for regular unissued shares.[70] The distinction between the two views is that in the first, a

[66] A portion of this discussion has been abridged from an M.B.A. thesis of Avie Elizabeth Squier entitled "The Accountancy Aspects of Legal Capital" (The University of Texas Library).

[67] Marple, 9 *Accounting Review* 77; (1944) Sunley-Carter 116–129; Homburger, 24 *Accounting Review* 199–200.

[68] Homburger, 24 *Accounting Review* 202 (quoted by permission). See also (1946) Kester 449.

[69] (1944) Sunley-Carter 126; (1933) Kester 447.

[70] Payne, 8 *Accounting Review* 5.

portion of the amount previously paid in on the shares may become legal capital, while under the second, the new consideration must be sufficient to take care of the legal capital requirement for unissued shares. In some instances, it should be noted that state statutes prescribe the consideration which must be received for the resale of forfeited stock; in the absence of applicable legislation the most reasonable view seems to be the first one given above.[71]

Legal differences of opinion are also present in regard to the question as to when the payments made on stock before its forfeiture may be carried to Paid-in Surplus. One group of authorities state that Paid-in Surplus may be credited at the time the payments are forfeited to the corporation, which view is based on the idea that these amounts represent contributions by stockholders whose interests in the legal capital terminate with the forfeiture of their subscriptions. In other words, the payments made prior to the forfeiture represent an excess of contributed over legal capital.[72] A second group of accountants and lawyers insist that the payments made on forfeited stock must be considered as part of the legal capital and kept for the possible benefit of creditors until the stock is resold. This view is based (1) on the idea that the shares may be reissued for a consideration less than par, and (2) that until sold the amount paid by the ex-stockholders is contributed capital belonging to the other shareholders.[73] Both of these viewpoints obtain the same results in so far as legal capital is concerned, provided the forfeited shares are reissued. If the shares are not reissued, the legal capital presentation is not identical, differing by the amount of the payments made on the shares forfeited. In addition, even if the shares are later issued, the paid-in surplus will not be the same unless in both cases the forfeited shares are reissued at par.

The journal entries for forfeited subscriptions are given in the following subsection where they are contrasted with the entries for the sale of the defaulting subscriber's stock under a lien.

*Forfeited subscriptions sold under lien.* In some states the statutes provide that the corporation must sell under a lien the stock represented by the subscription of the defaulting subscriber. This must usually be done at an open auction, and the corporation pays to the defaulting subscriber the proceeds less the unpaid balance of the original subscription price and less the expense caused by the sale. The journal entries up to the date of the default would be the same as those that would have been made up to that date if the subscriber had not defaulted. Subsequent to default the entries shown in the following illustration would be recorded:

[71] (1944) Sunley-Carter 126.
[72] Marple, 9 *Accounting Review* 77.
[73] Thompson, 7 *Accounting Review* 160.

*Illustration*

Assume that 5,000 shares of common stock, par $10 a share, are subscribed at $11 per share payable $5 cash and two installments of $3. After paying the first $3 installment, a subscriber for 50 shares defaulted and the stock was sold at $10.80 per share cash. The expenses of the second sale were $15. Journalize if the subscription were declared forfeited and if the stock were sold under a lien. Use Paid-in Surplus accounts given on pages 32–34.

| | Forfeiture procedure | | Sale under lien procedure | |
|---|---|---|---|---|
| Subscribers to Common Stock | $30,000 | ..... | $30,000 | ..... |
| Cash | 25,000 | ..... | 25,000 | ..... |
| Common Stock Subscribed | ..... | $50,000 | ..... | $50,000 |
| Paid-in Surplus (From Present Common Stockholders) | ..... | 5,000 | ..... | 5,000 |
| For original sale. | | | | |
| Cash | 15,000 | ..... | 15,000 | ..... |
| Subscribers to Common Stock | ..... | 15,000 | ..... | 15,000 |
| For first installment of $3 per share. | | | | |
| Common Stock Subscribed (50 × $10) | 500 | ..... | 500 | ..... |
| Paid-in Surplus (From Present Common Stockholders) | 50 | ..... | ..... | ..... |
| Subscribers to Common Stock (50 × $3) | ..... | 150 | ..... | 150 |
| Paid-in Surplus (Miscellaneous) | ..... | 400 | ..... | ..... |
| Due to Defaulting Subscriber | ..... | ..... | ..... | 350 |
| For cancellation of subscription. | | | | |
| Cash (50 × $10.80) | 540 | ..... | 540 | ..... |
| Paid-in Surplus (From Present Common Stockholders) | ..... | 40 | ..... | ..... |
| Common Stock Subscribed | ..... | 500 | ..... | 500 |
| Due to Defaulting Subscriber | ..... | ..... | ..... | 40 |
| For resale. | | | | |
| Common Stock Subscribed | 500 | ..... | 500 | ..... |
| Unissued Common Stock | ..... | 500 | ..... | 500 |
| For issue of resold shares now fully paid. | | | | |
| Paid-in Surplus (Miscellaneous) | 15 | ..... | ..... | ..... |
| Due to Defaulting Subscriber | ..... | ..... | 15 | ..... |
| Cash | ..... | 15 | ..... | 15 |
| For expense of resale. | | | | |
| Due to Defaulting Subscriber | ..... | ..... | 375 | ..... |
| Cash [(50 × $10.80) − $150 − $15] | ..... | ..... | ..... | 375 |
| For payment to defaulting subscriber. | | | | |

**Original opening entries for no-par value capital stock.** The opening entries for no-par stock differ somewhat from those involved in recording par stock. In the first place, in view of the no-par nature of the stock it is

impossible to assign any dollar amount to the authorized shares. However, the following memo entry may be recorded if desired:

| | | |
|---|---|---|
| Common (or Preferred) No-par Stock Unissued . . | (No dollar amount) | |
| Common (or Preferred) No-par Stock Authorized . | | (No dollar amount) |
| To record the number of no-par shares authorized by charter, e.g., 500 shares of common. | | |

Succeeding entries for no-par stock vary depending upon whether a "stated" value is assigned to the stock, or whether a "stated" value is forbidden by statute. In many states the use of a stated value per share is permitted, the decision being determined either by provisions in the charter or sometimes by provisions of the bylaws, or finally, sometimes by action of the board of directors. The dollar amount of the stated value, in the absence of statutory provisions may be any sum.[74] In journalizing no-par stock under the stated value method, the stated value should be considered as an unofficial par value; any excess paid in by subscribers is credited to Paid-in Surplus (From Present No-par Stockholders). In most of the jurisdictions, the statutes require that the division of the proceeds of sale be made before the stock is delivered. The Michigan law, however, requires that such division be made on or before the date of the sale of the stock unless the consideration received is other than money; in the event the stock is exchanged for property, the corporation is allowed sixty days within which to make the division. If the designation of the stated value is not determined within the time limit, the entire consideration must be designated as legal capital. Another restriction sometimes placed on the issue of no-par stock by state legislatures is to specify certain minimum and maximum prices for which a corporation may sell its shares. A modification of this last type of law is found in those jurisdictions which require a minimum authorized capital, and a minimum "paid-up operating capital." [75]

Some states, such as Texas, require that all the receipts from the issue of no-par stock be credited to the No-par Common (or Preferred) Stock account.

From the preceding discussion it may be observed that there are important differences between the states in regard to the recording of no-par stock issues. The following illustrative journal entries are presented in order for the student to have before him the ordinary entries made for no-par shares:

[74] Michigan, for example, requires that at least 50 per cent of the consideration received be called "capital."

[75] Alabama, for instance, requires an authorized capital of $2,000, and a minimum "paid-up capital" of not less than 25 per cent of the authorized capital stock, or in no case less than $1,000. The figures apply to both par and no-par stock. Alabama Code 1940, Title 10, p. 149.

(1)

| | | |
|---|---|---|
| Subscribers to No-par Common (or Preferred) Stock | $.... | |
| No-par Common (or Preferred) Stock Subscribed (at stated value) | | $.... |
| Paid-in Surplus (From Present Stockholders) | | $.... |

To record total amount to be paid by subscribers. The entry assumes that no-par stock is to be recorded at stated value; otherwise all of credit would go to No-par Stock Subscribed account.

(2)

| | | |
|---|---|---|
| Cash (or other property) | $.... | |
| Subscribers to No-par Common (or Preferred) Stock | | $.... |

To record collection of amounts subscribed.

(3)

| | | |
|---|---|---|
| No-par Common (or Preferred) Stock Subscribed | $.... | |
| No-par Common (or Preferred) Capital Stock | | $.... |

To record issue of no-par certificates.

Or the following entry may be made in place of (3) above:

| | | |
|---|---|---|
| No-par Common (or Preferred) Stock Subscribed | $.... | |
| Common (or Preferred) No-par Stock Issued | | $.... |

To record issue of no-par certificates.

**No-par forfeited stock.** The procedure in handling forfeited no-par stock subscriptions is dependent upon whether the stock is sold under lien or declared forfeited. If sold under lien the entries are similar to those given on page 51 for par stock. If, on the other hand, the stock is declared forfeited and the corporation retains the amount paid in, the entries would be as follows (Paid-in Surplus accounts given on pages 32–34 used):

(1)

(If no stated value)

| | | |
|---|---|---|
| Subscribers to No-par Common | $11,000 | |
| No-par Common Stock Subscribed | | $11,000 |

To record subscriptions taken for 1,000 shares no-par common at $11.

or (if stated value)

| | | |
|---|---|---|
| Subscribers to No-par Common | 11,000 | |
| No-par Common Stock Subscribed | | 5,000 |
| Paid-in Surplus (From Present Common Stockholders) | | 6,000 |

To record subscriptions taken for 1,000 shares no-par common at $11 with $5 stated value.

(2)

| | | |
|---|---|---|
| Cash | 3,000 | |
| Subscribers to No-par Common | | 3,000 |

To record collection on subscription (same entry whether stated value or no stated value).

(3)
(If no stated value)

| | | |
|---|---|---|
| No-par Common Stock Subscribed | $11,000 | |
| Subscribers to No-par Common | | $8,000 |
| Paid-in Surplus (Miscellaneous) | | 3,000 |
| To record forfeiture. | | |

or (if stated value)

| | | |
|---|---|---|
| Paid-in Surplus (From Present Common Stockholders) | 6,000 | |
| No-par Common Stock Subscribed | 5,000 | |
| Subscribers to No-par Common | | 8,000 |
| Paid-in Surplus (Miscellaneous) | | 3,000 |
| To record forfeiture. | | |

**Payment for capital stock.** Capital stock may be issued for cash, property, services, or a combination of the three. In view of the several possibilities which may arise, the accounting problems involved in recording the payment for stock range from situations easy to handle to relatively complex cases. The nondifficult situations are those in which cash is the sole consideration. In such a case there is little doubt as to the "value received," and the entries are made according to the techniques already discussed in prior sections of this chapter.

When capital stock is sold or exchanged for property or services, however, several interesting and significant problems arise. The first of these is concerned with the assignment of responsibility for determining the valuation to be placed on the property or services. In practically all the states, the statutes and courts insist that the original responsibility rests on the board of directors. There are, however, two lines of reasoning which the several jurisdictions have adopted. First, under the "fraud doctrine," or the "good faith" rule, it is only necessary that the directors act in good faith and fairly.[76] Second, under the "true value" rule, if stock is issued for property or services, the stockholder, in order to relieve himself of liability to creditors must prove that the property (or services) exchanged for shares was actually worth in cash money the subscription value of the shares.[77] Both of these rules have obviously been set up by the legislatures and the courts to give them the power to correct unconscionable issues of stock, whether they use cash value of the consideration or the reasonable business man's valuation opinion as the primary test.[78]

[76] (1937) Montgomery 481.

[77] In regard to this rule, a prominent writer has stated: "When a corporation acquires property in exchange for its own stock rather than for cash, the cost of the property to the acquiring company is usually measured by the estimated cash value of the stock that is issued by the acquiring company at the time when the exchange is made." Bonbright, 20 *Accounting Review* 446.

[78] Paragraph 234, Constitution of Alabama of 1901, for example, provides that "no corporation shall issue stocks or bonds except for money, labor done, or property actually received; and all fictitious increase of stock or indebtedness shall be void."

According to most authorities, and in view of what has been stated in the preceding paragraph, the responsibility of the accountant in this matter is definitely secondary. As far as the internal accountant is concerned (if he has no knowledge of fraud and is acting only as an employee of the corporation) he should record the stock entries in accordance with the valuations determined formally by the board of directors.[79]

The accountant in public practice, on the other hand, is in a different position, since he is usually expressing in his report an "informed" opinion as to the position of the enterprise in question. This places on the public accountant the responsibility of determining whether or not the valuations are misleading.[80] The Securities and Exchange Commission has taken an active interest in this matter, and based upon a study of the cases decided by the Commission, one authority has drawn the following conclusions.[81]

1. Where a corporation issues its capital stock ostensibly in consideration of assets conveyed to the corporation and a portion of such capital stock is not retained by the vendor but, in fact, finds its way into the hands of a promoter, then that portion of the stock which is received by the promoter shall not be considered as representing a cost of the assets ostensibly acquired, but rather such shares shall be considered as having been issued for promotional services.

2. The next conclusion apparently adopted by the Commission is that if assets are acquired by a corporation in consideration of the issue of its capital stock and if about the same time and pursuant to a previous understanding the vendor donates a portion of such capital stock to the corporation, then the assets shall be considered to have been acquired for the net amount of the capital stock retained by the vendor.

3. Another conclusion apparently adopted by the Commission is that if assets are acquired by a corporation in consideration of the issue of its capital stock and if other events occurring about the same time (e.g., the sale of similar stock or the granting of an option on similar stock) indicate that such capital stock has a market value less than its par or stated value, then the cost of the assets acquired shall be based upon the market value of the stock, the difference between the market value and the par or stated value representing a discount to be treated in the same manner as the discount on capital stock sold for cash.

4. The fourth conclusion apparently adopted by the Commission deals with the case where assets are acquired by a corporation from a promoter (who is in control of the corporation at the time of the acquisition) in

[79] (1944) Sunley-Carter 46.
[80] *Unity Gold Corporation*, 1 SEC 25.
[81] Adapted from Short, 67 *Journal of Accountancy* 262.

consideration of the issue of the corporation's capital stock. In such cases, if the proper value of the assets, determined in accordance with the principles already outlined, exceeds the cost of such assets to the promoter, then the amount of such excess must be considered as a payment for services. In most cases the services would be promotional and the payment would be so treated.

5. The last conclusion apparently adopted by the Commission is that if a corporation makes any payment for promotional services and if the amount of payment is so grossly and indefensibly excessive as to be outside the range of reasonable difference of opinion, the amount of such excessive payment shall be regarded as a gift.

In regard to the fifth conclusion above the authority referred to fails to see any "merit whatever in the proposition." He states that "it would result in many companies having deficits before they commenced operations (the amount of the deficit being equal to the so-called gift) and it would also result in our facing the practically impossible task of measuring the value of promotional services." [82] The present authors agree that it is very difficult to select an appropriate and nondeceptive base for recording in dollars the value to be given to stock issued as compensation — even more difficult than in the case of property. The following possible bases have been suggested: [83]

1. Par value or stated value of the stock
2. Market value or "fair" value of the stock on a given date
3. Average market value of the stock over the employment term
4. Cost of the stock to the issuing corporation (in case of issue of treasury stock as compensation)
5. Book value of the stock
6. "Fair" value of the services to be exchanged for the stock. (This is the conclusion adopted by the Securities and Exchange Commission — see above.)

In most instances, either the first or second base suggested above has been adopted, the final decision being made by the board of directors.[84]

The Securities and Exchange Commission *Accounting Series Release No. 68* provides an excellent example of the views of the Commission. A portion of this release is quoted below (letters are substituted for names of actual persons and firms). The registration statement as originally filed contained the following balance sheet:

[82] Short, 67 *Journal of Accountancy* 262.
[83] Kunkel, 68 *Journal of Accountancy* 48.
[84] For a discussion of the views of the Securities and Exchange Commission see Dohr, 71 *Journal of Accountancy* 95, commenting on *Poulin Mining Company Limited*, 8 SEC 116. The Commission has consistently adhered to the doctrine of full disclosure and the eliminating of misleading statements.

**ABC, Inc.,**
**Balance Sheet**
November 20, 1946

ASSETS

| | |
|---|---|
| Leasehold | $100,000.00 |
| Construction Work in Progress | 7,417.24 |
| Organization Expense | 5,178.15 |
| Total Assets | $112,595.39 |

LIABILITIES

| | |
|---|---|
| CURRENT LIABILITIES: | |
| Due on Architect's Contract | $ 2,000.00 |
| Account Payable to XYZ | 10,595.39 |
| Total Liabilities | $ 12,595.39 |
| CAPITAL STOCK: | |
| Prior Preferred 5½% Cumulative (authorized, 50,000 shares — par value $10 per share — none issued). | |
| Common (authorized, 50,000 shares — par value $10 per share — issued and outstanding, 10,000 shares) | 100,000.00 |
| Total | $112,595.39 |

*Note to Balance Sheet:*

Additional liabilities for organization expenses and construction work in progress (not yet capitalized) have been incurred in undetermined amounts, believed not to exceed $5,000.00 at November 20, 1946, for services of accountants, architects, attorneys, and engineers.

(1) It was alleged in the order for hearing and R [member of accounting firm] admitted that the amount, $100,000, shown in the balance sheet for the item Leasehold was improper, and that the amount shown, $100,000, in respect of the item Capital Stock, Common, was likewise improper without deducting the discount resulting from its issuance for a nominal consideration.

The leasehold in question was a 99-year lease, dated July 15, 1946, covering approximately 96/100ths of an acre in Hot Springs. It ran to XYZ, president and principal promoter of ABC, as lessee, and was assigned by him to the company on November 16, 1946, in exchange for 9,998 shares of common stock. The lease provided for a monthly rental of $150 a month for the first three months, $300 a month thereafter until June 15, 1971, and $150 a month from that date until the end of the term. Among other things, the lease required the lessee to pay all taxes and to move the existing houses on the property to other property owned by the lessors.

The circumstances under which XYZ entered into this lease are not shown by the record in this proceeding. It is clear, however, that there is no justification for its appearing in the balance sheet at a figure of $100,000. The deed conveying the property to the lessors is dated April 30, 1945, and recites a consideration of $15,000. The property was assessed for the year 1946 at $5,250 of which $3,000 was allocated to improvements. The expenses of XYZ in connection with the lease were nominal. Notwithstanding his full knowledge of these facts, R, on behalf of ST, certified falsely that the balance sheet, on which the leasehold was shown at $100,000, conformed to generally accepted accounting principles.

In the second balance sheet, contained in the amendment to the registration statement, the following note was appended to the item "Leasehold — $100,000.00":

"(1) Valuation of leasehold is purely arbitrary, and is placed at a figure to equal the par value of the common stock issued in exchange for the leasehold. The direct cost of the above lease to XYZ, personally, and the assignment of the same to ABC exceeded $2,000. In addition, XYZ has spent an excess of $10,000 of his personal funds in the promotion of this enterprise. Neither of these costs (out-of-pocket expenses) is being borne by the Corporation. In addition to these out-of-pocket expenses, XYZ has spent his time and effort and experience over a period of approximately six months in the promotion of this enterprise with no cost to the Corporation."

The addition of this footnote did not cure the deficiency. Dealing with a similar situation, we said in *Queensboro Gold Mines, Ltd.*, 2 S.E.C. 860 (1937), at page 862:

"Nor is the mischief fully cured by an explanatory note revealing that the figure is 'purely arbitrary' and that the vendor, who purchased the property 'at a nominal cost' to himself, 'controlled the board who valued' the property. . . . Such disclosure, while helpful, is not sufficient."

And in *Mining and Development Corporation*, 1 S.E.C. 786 (1936), at page 799 we said:

"Moreover, even were the footnote to state with complete frankness the true fact that the assets were over-valued, this would not mitigate the effect of the valuation figure itself. A balance sheet item which is flatly untrue will not be rendered true merely by admission of untruth."

As stated above, it was charged that the amount, $100,000, shown in the balance sheet with respect to the item Capital Stock, Common, was improper in that the discount resulting from the issuance of the stock for a nominal consideration was not deducted. As the stock was issued for the leasehold, which, it is admitted, was improperly shown on the balance sheet at $100,000, it follows that it was improper to indicate that the stock had been issued at its full par value, whereas, in fact, it had been issued at a discount.[85]

(2) It was alleged in the order for hearing and admitted by R that the balance sheet as at November 20, 1946, improperly included the items "Construction Work in Progress — $7,417.24," "Organization Expense — $5,178.15," and "Account Payable to XYZ — $10,595.39."

The amount of $7,417.24 shown for "Construction Work in Progress" included $2,000, liability for which was shown in the balance sheet under the caption "Due on Architect's Contract." The remainder, $5,417.24, of the item "Construction Work in Progress" and the amount of $5,178.15 shown as "Organization Expense" constituted the alleged liability of $10,595.39 to XYZ. . . .

It is clear that the inclusion in both balance sheets of the amount of $100,000 in respect of the leasehold, and of a similar amount for Capital Stock, Common, and the inclusion in the balance sheet as of November 20, 1946, of the amounts of $7,417.24, $5,178.15, and $10,595.39 for Construction Work in Progress, Organization Expense, and Account Payable to XYZ, respectively, contravened generally accepted accounting principles. The balance sheets, therefore, did not fairly present the financial position of the company. . . .

[85] The impropriety here results from the use of the once very common, but now thoroughly discredited, device of employing par value as a representation of value for financial statement purposes. This practice developed from a widespread misconception of the meaning and significance of par value. See Hatfield, *Accounting*, 1927, pp. 72, 196–209; also Newlove, Smith, and White, *Intermediate Accounting*, 1939, pp. 239–240; and May, *Financial Accounting*, 1943, p. 109. [Footnote in original release.]

An interesting alternative approach to the problem of preparing formal balance sheets for corporations in their early promotional years has been suggested by one authority.[86] It may be referred to as the "full disclosure" procedure, and involves the following practices:

1. A formal balance sheet should not be required by corporations in the promotional stage of development where an unbiased appraisal of property acquired or to be acquired has not been made or where cash or cash value costs are not applicable.
2. In lieu of the formal balance sheet a textual or tabular statement of financial condition should be set out consisting of the following:
   a. A description of the particular assets the exploitation of which is to comprise the business
   b. Schedules of current assets and deferred charges and all liabilities, naming all affiliated companies or persons to whom debts are owed
   c. A schedule of capital stock containing the following data:
      (1) Number of shares authorized
      (2) Number of shares outstanding
      (3) Number of shares in treasury
      (4) Number of shares issued to promoters for property and services
      (5) Number of shares issued to persons other than promoters for property and services
      (6) The cost per share of stock to directors, officers and promoters and the cost per share to public
   d. A statement of percentages of stock issued to promoters for property or services to the total stock to be presently outstanding on completion of the proposed financing. If more than one class of stock is outstanding, the percentage of total profits accruing to promoters as a result of their stock ownership should be stated.
   e. A statement of cash receipts and disbursements, by years, from the date of organization
   f. Certification of these facts by an independent public accountant

Some of the above suggestions have been adopted by the Securities and Exchange Commission. In Article 5A of *Regulation S–X*, dealing with commercial, industrial and mining companies in the promotional, exploratory or development stage, the Commission has adopted the following rules:

**Rule 5A–01. Application of Article 5A.**

This article shall be applicable to the financial statements filed as a part of:
(a) Registration statements on Form S–2, Form S–3, or Form S–11, except as otherwise specifically provided in such forms, under the Securities Act of 1933;
(b) Applications for registration and annual reports pursuant to Sections 12, 13, and 15 (d) respectively of the Securities Exchange Act of 1934 filed by commercial and industrial companies in the promotional or development stage which, if registering under the Securities Act of 1933, would be required to use Form S–2.

[86] C. Aubrey Smith, 60 *Journal of Accountancy* 204.

(c) Applications for registration and annual reports pursuant to Sections 12, 13, and 15 (d) respectively of the Securities Exchange Act of 1934 filed by mining companies not in the production stage [87] but engaged primarily in the exploration for or the development of mineral deposits other than oil, gas or coal, if all of the following conditions are met:

(1) The registrant has not been in production during the period of the report or the two years immediately prior thereto; except that being in production for an aggregate period of no more than eight months over the three-year period shall not affect the use of the form.

(2) Receipts from the sale of mineral products or from the operation of mineral producing properties by the registrant and its subsidiaries combined have not exceeded $500,000 in any of the most recent six fiscal years and have not aggregated more than $1,500,000 in the most recent six fiscal years.

**Rule 5A-02. Statement of Assets and Unrecovered Promotional, Exploratory, and Development Costs.**

The statement of assets and unrecovered promotional, exploratory, and development costs filed for persons to whom this article is applicable shall comply with the following provisions:

CURRENT ASSETS

1. **Cash and cash items.**

2. **Marketable securities.** Include only securities having a ready market. Securities of affiliates shall not be included here. State here the basis of determining the amount at which carried. The aggregate cost and aggregate amount on the basis of current market quotations shall be stated parenthetically or otherwise.

3. **Accounts and notes receivable.**

4. **Reserve for doubtful accounts and notes receivable.**

5. **Inventories.** State separately each major class of inventory and the basis of determining the amounts shown. Any classification that is reasonably informative may be used.

6. **Amounts due from underwriters, promoters, directors, officers, employees, and principal holders of equity securities other than affiliates.** State separately the total amount, if significant, due from each class of persons named in the caption to this paragraph. Exclude from the amounts set forth hereunder trade accounts subject to the usual trade terms.

7. **Other current assets.** (a) State separately (1) total of current amounts due from parents and subsidiaries; and (2) any other amounts in excess of five percent of total current assets, indicating when any such amount is due from affiliates other than parents and subsidiaries; (b) indebtedness of a parent or subsidiary, or an affiliate designated under (a) (2) shall not be considered current unless the net current asset position of such person justifies such treatment.

8. **Total current assets.**

[87] For the purpose of financial statements prepared pursuant to the instructions contained in this article a mine will be considered to have passed from a development to a production stage when the major portion of the mineral production is obtained from workings other than those opened for the purpose of exploration or development or when the principal activity of the mine becomes the production of developed ore rather than the development of additional ores for mining. [Footnote in original rule.]

OTHER ASSETS AND UNRECOVERED PROMOTIONAL, EXPLORATORY, AND DEVELOPMENT COSTS

9. **Securities of affiliates.**

10. **Indebtedness of affiliates.** Not current.

11. **Other security investment.** In a note herein referred to state the basis of determining the amount. If available, state parenthetically or otherwise the aggregate amount on the basis of market quotations.

12. **Amounts due (not current) from underwriters, promoters, directors, officers, employees, and principal holders of equity securities other than affiliates.** The instruction to caption (6) shall apply here.

13. **Property, plant, and equipment.**[88] (a) Identify separately intangible property and property held under lease, option, and lease and option agreements. Identify items acquired from persons having a material relationship to the registrant. Extend only the total number of units of each class of securities, the amount of cash, and/or an indication of anything else, given by the registrant therefor. Except as stated in the footnote, dollar amounts shall be extended only for cash transactions.

(b) In a note state as to property held under lease, option, or lease and option agreements or purchase contracts (1) the nature and amount of future payments to be made, (2) whether the property on default will revert to the seller, and (3) whether any assets constructed on or attached to the property will become the property of the seller on default.

13A. **Mine property.** Set forth hereunder property usually extinguished by depletion such as mines, mining claims, water rights, land for waste dumps, and similar property. The instructions set forth under caption 13, including footnote (88) if applicable, shall also apply to this caption.

14. **Unrecovered promotional, exploratory, and development cost.** Set forth under this caption unrecovered costs incurred in promotion, exploration and development.

State separately (a) development expenses, (b) plant and equipment maintenance expenses, (c) rehabilitation expenses, (d) general administrative expenses incurred in a period when there was little or no actual mining and (e) other expenses. Do not include securities selling costs under this caption but include them under captions (17) or (18). General administrative expenses incurred in connection with subcaptions (a), (b) and (c) should be included therein. Any other general administrative expenses not chargeable to those subcaptions and not written off as costs or other operating charges (including taxes, protection and conservation of property when inactive) shall be included under subcaption (d). Extend only the total number of units of each class of securities, the amount of cash and/or an indication of anything else, given by the registrant. Dollar amounts shall be extended only for cash transactions, including, when appropriate, depreciation,

[88] Special instructions regarding this caption for mining companies using Article 5A: Include hereunder only depreciable mine plant and equipment. See caption 13A for the disposition of mine property subject to depletion. In those situations where depletable mine property and depreciable mine plant and equipment and other assets were acquired in one transaction in exchange for capital stock of the registrant or for cash, capital stock, or other securities of the registrant and any other consideration, the assets acquired, such as accounts receivable, supplies, buildings, mining and mill equipment, which have a fixed or objectively determinable value should be valued on those bases. The dollar amounts assigned to these properties shall be extended. [Footnote in original rule.]

depletion, and amortization of assets extended at dollar amounts under captions 13 and 13A. The instructions set forth under caption 13, footnote (88) to caption 13 and caption 13A, if appropriate, should be applied also to any unrecovered promotion, exploratory, and development costs incurred by predecessors of the registrant.

15. **Reserves for depreciation, depletion, and amortization of property, plant, and equipment and unrecovered promotional, exploratory, and development costs (or reserves in lieu thereof).** Set forth hereunder only the amount of the reserve for depreciation, depletion, and amortization of property, plant, and equipment and unrecovered costs incurred in promotion, exploration, and development applicable to the dollar amounts extended under captions 13, 13A and 14 above.

16. **Prepaid expenses and other deferred items.** State separately any significant items not shown elsewhere. Prepayments of services to be received within one year may, however, be included under caption 7.

17. **Debt discount and expense.** State in a note referred to in the statement of assets and unrecovered promotional, exploratory, and development costs the method used in amortizing such debt discount and expense.

18. **Commissions and expense on capital shares.** Explain in a note referred to in the statement of assets and unrecovered promotional, exploratory, and development costs what provisions have been made for writing off these items.

19. **Other assets.** State separately any other item in excess of five percent of the amount of all assets other than fixed and intangible ones.

**Rule 5A–03. Statement of Liabilities.**

The statement of liabilities filed for the persons to whom this article is applicable shall comply with the following provisions:

CURRENT LIABILITIES

1. **Notes payable.** State separately amounts payable (a) to banks; (b) for merchandise, materials, supplies, and expenses incurred in the ordinary course of business; and (c) to others.

2. **Accounts payable.** State separately amounts payable (a) for merchandise materials, supplies, and expenses incurred in the ordinary course of business; and (b) to others.

3. **Accrued liabilities.** State separately (a) accrued payrolls; (b) tax liability; (c) interest; (d) rents and royalties; and (e) any other significant items. If the total under this caption is not significant it may be stated as one amount.

4. **Amounts due to underwriters, promoters, directors, officers, employees, and principal holders of equity securities other than affiliates.** State separately the total amount, if significant, due to each class of persons named in the caption to this paragraph. Exclude from the amounts set forth hereunder trade accounts subject to the usual trade terms.

5. **Other current liabilities.** State separately (a) dividends declared; (b) notes and mortgage instalments, mortgages due within one year, and payments on other long-term debt due within one year; (c) total of current amounts due to parents and subsidiaries; and (d) any other item in excess of five percent of total current liabilities indicating any such liability due to affiliates other than parents and subsidiaries. Remaining items may be shown in one amount.

6. **Total current liabilities.**

DEFERRED INCOME

7. **Deferred income.**

LONG TERM DEBT AND OTHER LIABILITIES

8. **Bonds, notes, and other liabilities represented by securities.** Show for each class (a) title of the class; (b) the amount authorized; (c) the amount issued; and (d) the amount reacquired and held in the treasury (show such amount as a deduction). As to issued securities, show separately in a note the amount issued for (1) cash, (2) property, and (3) services. The facts and amounts with respect to any defaults in principal, interest, sinking fund, or redemption provisions shall be stated.

9. **Indebtedness to affiliates.** Not current.

10. **Amounts due (not current) to underwriters, promoters, directors, officers, employees, and principal holders of equity securities other than affiliates.** The instruction to caption 4 above shall apply here.

11. **Other liabilities.** Not current. State separately any significant items. State whether accrued, and the interest rate if any.

12. **Total liabilities.**

**Rule 5A-04. Statement of Capital Shares.**

The statement of capital shares filed for the persons to whom this article is applicable shall comply with the following provisions:

1. State for each class of capital shares the title and number of shares (a) authorized, (b) issued, (c) reacquired and held in the treasury, (d) outstanding, and (e) reserved for option, warrant, conversion, and other rights to acquire such shares.

2. As to each class of issued shares state the number of shares issued for (a) cash, (b) services, and (c) property.

3. If there are any shares subscribed for but unissued, state the number of shares of each class subscribed for, the subscription price, the total amount receivable thereon, and the approximate due dates. If payable otherwise than in cash, explain. If any unpaid amounts on such shares are past due, state the number of shares and amounts involved.

4. If any shares are assessable, state the aggregate and per-share amounts of assessments levied. If any such assessments have not been paid, state the number of shares and amounts involved, indicating separately any amounts past due.

5. If any shares have been issued subject to a liability for further calls, state the number of shares so issued and the aggregate and per-share amounts of such liability. State also the aggregate amount of any past due calls.

6. If any shares have been forfeited for non-payment of assessments or calls thereon, state the number of shares involved and the present status of such shares.

7. State the total amount of underwriting discounts and commissions incurred on sale of capital shares.

8. As to any arrears in cumulative dividends, the amount per share and in total shall be stated.

9. If preferred shares are callable, the date or dates and the amount per share and in total at which such shares are callable shall be stated. Preferences on involuntary liquidation, if other than par or stated value, shall be shown. A statement shall be made as to the existence, or absence, of any restrictions upon sur-

plus growing out of the fact that upon involuntary liquidation the preference of the preferred shares exceeds its par or stated value.

**Rule 5A–05. Statement of Other Securities.**

If the persons to whom this article is applicable have any securities with respect to which information is not called for in the statement of liabilities or in the statement of capital shares, furnish as to such securities information corresponding to that required in those statements.

**Rule 5A–06. Statement of Cash Receipts and Disbursements.**[89]

The statement of cash receipts and disbursements filed for persons to whom this article is applicable shall comply with the following provisions:

RECEIPTS

| | |
|---|---|
| Sale of securities | $..... |
| (Itemize receipts by classes of securities) | |
| Assessments | $..... |
| Loans by banks | $..... |
| Loans by others | $..... |
| Sale of products | $..... |
| Donations | $..... |
| Royalties | $..... |
| Rents, tolls, and similar receipts | $..... |
| Other receipts | $..... |
| (Specify and show separately any items of significant amount. Details may be given in a separate schedule if referred to under this caption.) | |
| Total receipts | $..... |

DISBURSEMENTS

| | |
|---|---|
| Loans repaid | $..... |
| Commissions and other selling expenses in connection with the sale of securities | $..... |
| Legal and accounting fees | $..... |
| Fees of engineers, appraisers, and other similar experts | $..... |
| Payments on options, leases, lease and option agreements, and purchase contracts | $..... |
| (Show separately each payment of significant amount and identify the property for which paid.) | |
| Royalties | $..... |
| Contract work (specify) | $..... |
| Purchase of equipment | $..... |
| Salaries of directors and officers | $..... |
| Other salaries and wages | $..... |
| Merchandise, materials, and supplies | $..... |
| Taxes | $..... |

[89] If the registrant maintains its books on the accrual basis items of income and expense reported in the statement of cash receipts and disbursements may be presented on such basis, provided entries are introduced in the statement to reconcile the figures in total to the cash receipts and cash disbursements respectively.

| | |
|---|---|
| Dividends | $..... |
| Other disbursements | $..... |
| (Specify and show separately any items of significant amount. Details may be given in a separate schedule if referred to under this caption.) | |
| Total disbursements | $..... |
| Net increase (or decrease) in cash during period | $..... |
| Cash and cash items balance at beginning of period | $..... |
| Cash and cash items balance at close of period | $..... |

**Reservations of capital stock.** Reservations of capital stock, which represent the setting aside of unissued or treasury stock to be issued for values not yet received or recorded, should be shown as memorandum information either in the capital stock section of the balance sheet or as a footnote. Illustrations of this type of reservation are shares reserved (1) for sales to employees and others; (2) to redeem stock rights, stock warrants, and options to purchase stock; (3) for conversion of other securities; and (4) to pay managerial bonuses when the agreements call for the issue of stock.

Reservations of capital stock, which represent the setting aside of unissued or treasury stock to be issued for values already received and recorded on the books, should be shown as an addition to the outstanding capital stock on the balance sheet. Illustrations of this type of reservation are shares reserved (1) to redeem scrip issued for the fractional-share parts of stock dividends, (2) to replace the capital stock of a predecessor company, (3) to exchange for shares of stock of former issues, and (4) for stock subscriptions and sales contracts.

*Employee stock options.* In recent years the practice has grown of offering stock to officers and employees as partial consideration for their services. This has been particularly true with top management individuals. However, since the most important aspect of this matter is concerned with the measuring of periodic income, a full discussion is postponed in this text to Chapter 14.

**Organization costs.** Organization costs include all the outlays and charges incurred up to the time the corporation is ready to operate, with the exception of the outlays which procure assets to be later used in operations. They may be classified as follows:

1. Incorporation costs
   (Fees to state)
   (Fees to attorney)
2. Underwriting costs
   (Cost of prospectuses)
   (Cost of securing stock subscriptions)
3. Promotion costs
   (Reasonable fees paid the organizers)

4. Accounting costs
   (Cost of printing and issuing stock certificates)
   (Cost of capital stock records)
   (Fees to accountant)
5. Office costs during organization period
   (Cost of stationery, postage, telephone, rent, etc., until business is ready to operate)

The breakdown of organization cost is very valuable as the detailed items should be carefully budgeted or they are likely to be greater than expected. In order to indicate the possibilities, the Securities and Exchange Commission analyzed the cost pertaining to 217 issues of securities offered for sale in 1937. The findings, expressed as percentages of the securities, were as follows:

| | Common Stock | | Preferred Stock | | Bonds and Notes | |
|---|---|---|---|---|---|---|
| On Dollar Size of Income | Underwriting Costs | Other Costs * | Underwriting Costs | Other Costs * | Underwriting Costs | Other Costs * |
| Under 250,000 | 19.9 | 2.5 | 14.3 | 3.0 | 5.9 | 3.4 |
| 250,000–499,000 | 17.8 | 2.0 | 17.5 | 2.0 | 6.4 | 2.9 |
| 500,000–749,000 | 17.2 | 1.9 | 10.0 | 1.8 | 5.6 | 4.2 |
| 750,000–999,000 | 15.8 | 2.4 | 14.1 | 1.6 | 2.8 | 1.4 |
| 1,000,000–4,999,000 | 14.3 | 1.4 | 8.1 | 1.2 | 3.3 | 1.5 |
| 5,000,000–9,999,000 | .... | ... | 3.2 | 0.5 | 3.6 | 1.2 |
| 10,000,000–24,999,000 | .... | ... | 2.8 | 0.5 | 2.1 | 1.0 |
| 25,000,000 and over | .... | ... | 2.7 | 0.3 | 1.8 | 0.5 |

* Includes listing fees, registration fees, revenue stamps, state qualification fees, trustee fees, printing and engraving, legal, accounting, and engineering costs, and miscellaneous.

This table shows that underwriting costs are much heavier than the other costs involved in the issue of securities and that the size of the issue greatly affects the cost. The statistics on bonds were included for sake of completeness as the costs of bond issues do not affect the Organization Costs account.

In order to understand the nature of organization costs, it should be observed that the legal concept of such expenditures differs from the accounting concept. The courts, on the one hand, look upon real organization costs as being only the "costs of incorporation" (outlays for the charter, related legal fees, etc.), while the accountant sees in them a great variety of costs necessarily incurred in getting a business ready to produce income (see outline at the first of this section). Income tax decisions, on the other hand, show a tendency to divide these costs into three groups: (1) ordinary expenses of carrying on a trade or business; (2) costs of incorporation; (3) costs of acquiring capital. This variation in concept has led to confusion and to many court decisions during the past three decades.

Accountants generally have agreed that it is proper to capitalize organi-

zation costs on the theory that they measure the excess value of an organized business over an unorganized one.[90] But the usual procedure is to remove this asset from the balance sheet within a short period (two to five years) by writing it off against income,[91] or against some surplus account,[92] Earned Surplus being preferred by most authorities.

Some accountants list the Organization Costs account on the balance sheet among the deferred charges,[93] some among the intangible, or "other" assets,[94] and still others deduct it from the Earned Surplus account.[95]

Sometimes the costs incurred in connection with the issuance and sale of capital stock are included in the Organization Costs account, but the placing of capital stock costs in a separate account was recommended as far back as 1922.[96] Power utilities must charge these costs either to Account 151, Capital Stock Expense (subdivisions for each class and series of capital stock), or to Account 414, Miscellaneous Debits to (Earned) Surplus; Account 151, Capital Stock Expense, may be amortized to Earned Surplus via Account 414, Miscellaneous Debits to (Earned) Surplus, but any unamortized balance pertaining to shares later reacquired or retired must be closed to Account 270, Capital Surplus, provided that debits shall be charged to Account 414, Miscellaneous Debits to (Earned) Surplus, if the amount thereof exceeds the balance in Capital Surplus.[97] Capital stock costs are sometimes written off against the payments made for stock instead of against current earnings. For instance, when no-par stock is sold at a given price less a commission for selling, the No-par Capital Stock account may be shown at the amount of the net proceeds without the disclosure of the underwriting costs although it would be preferable to insert the words "net cash proceeds" or some other indication that the deduction has been made.[98] Another illustration is the deduction of capital stock cost from the premium paid in on par value stock on the June 30, 1938 balance sheet of the Kerlyn Oil Company.[99]

The underwriting costs must be distinguished legally from discount on capital stock as the latter is usually prohibited by law. It is considered desirable practice to have the underwriting syndicate give a check to the

[90] (1933) Kester 395.
[91] (1927) Montgomery 621.
[92] (1936) MacFarland-Ayars 349; (1934) Finney, I, 70.
[93] Peloubet, M. E., *Audit Working Papers* (New York: American Institute Publishing Co., 1937), p. 124; (1934) Finney, I, 70.
[94] (1933) Kester 395; McKinsey, J. O., and Noble, H. S., *Accounting Principles* (Cincinnati: South-Western Publishing Co., 1935), p. 436.
[95] (1938) Taylor-Miller 128; (1934) Finney, I, 70.
[96] Conyngton, T., Bennett, R. J., and Pinkerton, P. W., *Corporation Procedure* (New York: Ronald Press Co., 1922), pp. 1134–1135.
[97] Federal Power Commission 13–14, 27.
[98] Accounting Questions Section, 56 *Journal of Accountancy* 237–238; (1931) Sunley-Pinkerton 194–195.
[99] Included in 10-K Report accepted by Securities and Exchange Commission.

corporation for the par value of the stock and then to have the corporation issue its own check for the underwriters' commissions. Aside from the statutory difference, the two concepts are practically identical. A commission paid for the sale of capital stock "is equivalent for income tax purposes to the sale of stock at a discount." [100] In another case the court said: "Commissions paid for marketing stock simply diminish the net return from the stock issue. Financially they are equivalent to an issue of stock at a discount from par." [101]

The difference between underwriting costs and the other organization expenditures has been outlined by the Board of Tax Appeals as follows: "It may be said the money expended to form a corporation results in the acquisition of an asset, namely, the corporate franchise, which may be considered as a balancing asset, but money paid out to acquire capital does not result in the acquisition of any asset other than the capital itself." [102]

*Recommended procedure.*[103] The present authors recommend that the divergent elements in organization costs be segregated on the accounts of the corporation and treated differently. As payments are made during the organization period, charges should be made to two accounts rather than a single one. All expenditures related to the securing of the corporate franchise should be charged to Incorporation Costs or to an account with a similar title. All outlays, on the other hand, in connection with the sale of the capital stock should be charged to another account with a title such as Costs of Securing Capital.

Expenditures which may be related to both of these accounts (incidental items, such as rent, office salaries, supplies, etc.) should be allocated on some reasonable basis to the two accounts mentioned. In case actual business operations are being carried on at the same time that organization is still in progress, an allocation should be made to charge an appropriate proportion of the incidental items to the ordinary expense accounts.

At the close of the first fiscal period — if organization has been completed by that time — the account, Costs of Securing Capital, should be closed to the Paid-in Surplus (Miscellaneous) account, if any exists. Otherwise, it should be shown in the Capital Stock section of the balance sheet as a deduction.

The Incorporation Costs account should be carried forward permanently in the ledger and classified on the balance sheet as an intangible "asset

[100] *Barbour Coal Co. v. Com'r.*, 74 Fed. (2nd) 163.
[101] *Simmons Co. v. Com'r.*, 33 Fed. (2nd) 75.
[102] *James I. Van Keuren*, 28 B.T.A. 480.
[103] See the M.B.A. thesis entitled "Legal and Accounting Aspects of Organization Expenses" of Vern H. Vincent, C.P.A. (The University of Texas Library).

as long as the enterprise maintains its momentum as a going concern." [104] If, however, the corporation has a fairly definite legal or operating life (such as a mining company or a limited life utility) the Incorporation Costs account should be treated as a deferred charge to be amortized systematically through such life.[105]

[104] (1943) Paton 128.
[105] (1939) Gilman 316.

# CHAPTER 3

## Treasury Stock and Capital Stock Retirement

**Treasury stock — general.** Treasury stock may be defined as shares of capital stock which, after having been fully paid and issued, are subsequently reacquired (by outlay or gift) by the issuing corporation, but not canceled. Its status as treasury stock is lost when it is formally canceled by legal procedure. The term "reacquired shares" has been suggested as being more descriptive,[1] but this has never become very popular.

Treasury stock may be acquired (as noted above) through an outlay of cash or other property, or by donation. While it is customary terminology to refer to the "purchase" of treasury shares (they may be, of course, "bought" through a stockbroker if they are listed on some stock exchange), it seems preferable to view such transactions simply as contractions of the number of shares outstanding.[2] This means that they would not be purchased in the usual sense of acquiring an asset, but would merely return to the reservoir of certificates which may be reissued or canceled at some appropriate time. This matter is discussed more at length in a later section of this chapter.

The different aspects of the accounting for treasury stock, as well as its legal nature, have been the subject of much discussion and literature during the past three decades. Several authorities have commented upon this "shopwornness," and have pointed out the overemphasis assigned the topic.[3]

Others have noted the fact that very few of the thousands of corporations now in existence ever reacquire their own stock. From the standpoint of practice, therefore, it is extremely doubtful if the matter deserves much attention. A thorough study of treasury stock is helpful, however, in gaining an understanding of several basic accounting concepts which are related to the handling of treasury stock but not necessarily peculiar to it. The discussion below is predicated upon this purpose.

**Legal status of treasury stock.** *English rule.* Although it appeared from early cases that the courts might hold that a corporation has implied power to purchase its own shares, the question was definitely settled in the negative by a ruling English case in 1887.[4]

As might be expected, the Canadian courts have followed the English

[1] (1944) Sunley-Carter 83.
[2] Paton, 27 *Journal of Accountancy* 321–335.
[3] (1945) Leland, Ch. 2, p. 22; (1944) Sunley-Carter 101.
[4] *Trevor v. Whitworth*, 12 App. Cas. 409.

rule in denying the corporation the power or legal right to purchase its own shares (except in very rare instances).

*United States rule.* Many of the state corporation statutes contain definite provisions relative to the power of a corporation to reacquire its own shares.[5]

The tendency in recent years, however, has been to place certain restrictions on the power to acquire the stock by outlay. These statutory restrictions take the form of providing that treasury stock can only be purchased:

1. To the extent of earned surplus
2. To the extent of surplus (defined as difference between total asset values and liabilities plus legal, or stated, capital)
3. If a majority of the stockholders consent
4. If the corporation is not rendered insolvent by such purchase
5. If the vendor is already in debt to the corporation and the purchase is to prevent a loss
6. If subscribers paying on the installment plan default (sometimes limited to cases in which there are no other bidders)
7. If the corporation merges with another corporation
8. If it is planned to resell or allot to employees
9. If more than the authorized amount of capital stock has been issued (enough shares can be purchased to remedy the illegality)

The American courts have recognized the power of the corporation to purchase its own stock for the following reasons: [6]

1. To settle a corporate debt, resulting from inability of subscribers to pay for subscriptions to capital stock. Although this is not strictly a purchase, it results in the reduction of a legal claim against the subscriber and has the same effect on the creditors' protection as a purchase of stock and payment with other assets.

2. To dispose of opposition from stockholders in order for the corporation to accomplish a desirable and legitimate purpose.

3. To restore harmony among stockholders when disagreements exist among themselves.

4. To carry out an agreement, made by the corporation at the time the shares were sold, to repurchase the stock in case the corporation fails to do some specific thing, such as the construction of a plant in which the share purchaser is interested.

5. To carry out the provisions of an employment contract, whereby the corporation promises to repurchase the stock of employees at the termination of the employment contract.

6. To effect a loan. In this case the corporation may sell stock under a contract to repurchase if the shareholders subsequently desire to sell their shares.

7. To perform the terms of a contract made by the corporation at the time of original issue to repurchase its own stock within a specified time or any time the stockholders wish to resell to the corporation. This type of repurchase agreement

[5] For a list see (1938) Sanders-Hatfield-Moore 88.
[6] Blackstock, 13 *Texas Law Review* 442.

has been severely criticized, and some cases have limited the privilege to situations where the consideration is something other than mutual promises.

8. To prevent loss on a debt previously contracted; but the corporation was required to dispose of such stock within a year from date of acquisition.

9. To reduce outstanding stock to amount called for in the charter.

10. To accomplish the desire of a corporation to retire from business. In the absence of fraud or unfair dealing, this is permissible, since the result is to distribute the net assets to stockholders.

The courts have refused to recognize the power of the corporation to reacquire its own shares in the following situations:

1. In the case of an overissue of stock because the person reselling to the corporation had purchased his shares before the overissue and subsequently the corporation became insolvent.

2. In the case where mutual promises constituted the only consideration in an agreement that the corporation would repurchase stock, and it resulted that the surplus of the corporation was not equal to the amount of the purchase.

*Dividend rights.* There is practically unanimous agreement that no dividends are to be allocated to treasury stock.[7]

While it is sometimes suggested that dividends be allocated to treasury stock held in a sinking fund, the Securities and Exchange Commission has ruled that such dividends should not be treated as income.[8] The Committee on Accounting Procedure of the American Institute of Accountants,[9] the Executive Committee of the American Accounting Association,[10] and the Committee on Stock List of the New York Stock Exchange have also expressed similar convictions.

*Voting privilege.* It is usually provided that the voting power attaching to stock cannot be exercised on treasury stock. The only way this could be done equitably would be to allocate the votes between the outstanding shares, from which procedure no advantage could be gained.

*Pre-emptive rights.* Stockholders do not ordinarily have the pre-emptive right to subscribe for treasury stock held by the corporation. One court has ruled, however, that if treasury stock is canceled and retired and is later reissued, the holders of the stock at the later date are entitled to an opportunity to take a proportionate share of it.[11]

*Right to sell.* Corporations may sell treasury stock when it is not specifically acquired for retirement.

*Sale below par.* Treasury stock may be sold below par without making the purchaser liable for the discount.[12] The shares reacquired may also be

[7] May, 66 *Journal of Accountancy* 17.
[8] *Accounting Series Release No. 5.*
[9] *Accounting Research Bulletin No. 1.*
[10] 16 *Accounting Review* 138.
[11] *Dunny v. Acme and Garage Company*, 168 Wis. 128.
[12] (1927) Ballantine 228.

issued as a stock dividend in case the board of directors deems it wise to do so.

**Treasury stock on the balance sheet.** An examination of the balance sheets of a representative group of corporations reveals that treasury shares are variously classified under the following theories:

1. The asset theory
2. The offset theory
3. The surplus deduction theory
4. The aggregate proprietary capital deduction theory

*The asset theory.* Many considerations have been advanced concerning the reasonableness of the asset theory of presenting treasury stock. These considerations may be summarized as follows:

1. When the shares are reacquired for the definite purpose of resale to officers and employees, or under conditions indicating clearly that the shares are salable without restrictions, have a ready market for the quantity held, and that resale will actually occur, the treasury stock may be presented as an asset.[13]
2. In the case of a going concern, the advocates of the asset theory state that the presentation of treasury shares as an asset in certain circumstances at some suitable valuation basis, properly reflects the financial position of the corporation with respect to shares.[14]
3. When treasury stock has been resold before the accountant's opinion is prepared or before the balance sheet is published, the treasury shares would be presented as an asset since the current assets have been increased just subsequent to the balance sheet date.[15]
4. Treasury stock may be shown as an asset provided a reason is given for such treatment, the usual reason being that it is the regular consistent practice of the corporation.[16]
5. Where, under state laws, the acquisition of treasury stock does not involve a reduction of capital (of some type), the treasury shares are assets in the hands of the corporation.[17]

The opponents of the asset theory contend that treasury shares should never be shown as an asset because:[18]

1. They do not represent assets in any of the usual senses.
2. They cannot be carried as an asset without being reflected in surplus to the extent of their indicated value.
3. Treasury shares have no more asset quality than ordinary unissued shares, which is nil.
4. They are not a property, interest, or claim, and not a form of self-ownership.

[13] Payne, 10 *Accounting Review* 88.
[14] Bowles, 58 *Journal of Accountancy* 101.
[15] Payne, 10 *Accounting Review* 88.
[16] Smith, 10 *Accounting Review* 325.
[17] Montgomery, 65 *Journal of Accountancy* 466–479.
[18] Hills, 57 *Journal of Accountancy* 210; (1936) Marple 61; Rankin, 15 *Accounting Review* 71.

5. On liquidation of the corporation they would, of course, produce nothing for creditors.
6. The fact that they have been once issued does not place a value on them after they have been reacquired by the corporation.
7. The fact that they have been acquired for a consideration does not mean that something of intrinsic value has been purchased.
8. Treasury stock has no right to vote.
9. Treasury stock has no dividend rights.

The accountants who oppose the classification of treasury stock as an asset have gained the ascendancy in recent years (see statistics presented at end of this section).

*The offset theory.* This theory implies that the treasury shares are deductible (separately) on the balance sheet from the contributed capital assigned to the class of shares within which they are included. The position taken is that the acquirement of treasury shares is a virtual retirement of capital contribution.[19]

Some authorities qualify their position, however, by stating that the offset theory should be applied only if cancellation of the shares is fairly certain.[20]

This theory has been severely criticized by some accountants who reason that when the offset presentation is adopted the impression is given that the legal capital has been reduced. If, however, the mathematical limitation concept of legal capital is adopted (as explained in Chapter 2) this objection loses much of its significance. In recent years there has been a modification of the offset theory which has as its purpose the presentation of the legal as well as the business and economic effect of treasury stock. The group supporting this modification states that the corporation should deduct treasury shares from capital stock, but at the same time recognize in the accounts a corresponding reservation of some form of surplus (see discussion in later section of this chapter).

*The surplus deduction theory.* This theory originated in the desire to follow several state laws which provide that treasury stock may be purchased only "out of surplus." More accurately this means that treasury stock in some states may be purchased only "to the extent of surplus," usually earned surplus. The surplus deduction theory advantages have been summarized as follows:

1. The balance sheet may be arranged distinctly to disclose the amount of stock issued and outstanding in the hands of the public.
2. The total stated capital may be readily designated.
3. The cost of the treasury shares may be readily displayed.

[19] Bowles, 58 *Journal of Accountancy* 100.
[20] Payne, 10 *Accounting Review* 89.

4. It at least indicates (by showing the cost of the shares) the amount by which the surplus accounts have been restricted in regard to future dividends.[21]

The following balance sheet display correctly shows (under this theory) the accountability for preferred and common shares outstanding, and in addition the legal capital is appropriately stated:

*Proprietorship*

| | | | |
|---|---|---|---|
| Capital: | | | |
| Preferred Stock Outstanding — 99,000 shares ($10 par) | | $990,000 | |
| Common Stock Outstanding — 184,000 shares ($1 par) | | 184,000 | |
| Capital Stock Reacquired (16,000 Common; 1,000 Preferred) | | 26,000 | $1,200,000 |
| Earned Surplus: | | | |
| Balance, January 1, 19— | | $300,000 | |
| Less: Operating loss for year | $50,000 | | |
| Cost of 16,000 common shares | 21,000 | | |
| Cost of 1,000 preferred shares | 5,000 | 76,000 | 224,000 |
| Total | | | $1,424,000 |

*The aggregate proprietary capital deduction theory.* Under this theory, the balance sheet presentation of treasury stock reflects the idea that treasury stock purchases are distributions of contributed capital. A corporation, for example, might show treasury stock as follows:

| | | |
|---|---|---|
| Capital Stock and Surplus: | | |
| Capital Stock: | | |
| 6% cumulative preferred — authorized 300,000 shares, par $100, issued 248,197 | | $24,819,700 |
| Common — authorized 3,000,000 shares of no par value, issued 1,999,970 shares, stated at | | 24,999,310 |
| Earned Surplus: | | |
| (Of which $187,391 is restricted by reason of purchase of treasury stock until resold or canceled) | | 6,171,850 |
| Total | | $55,990,860 |
| Less: Treasury Stock: | | |
| 123 shares preferred stock at cost | $ 10,416 | |
| 14,158 shares common stock at cost | 176,975 | 187,391 |
| Total | | $55,803,469 |

The aggregate deduction theory has been recommended as being particularly appropriate if disposition of the treasury shares is uncertain.[22]

One group of accountants, however, has expressed itself unequivocally in these words: "An outlay by a corporation for shares of its own stock should be treated as a reduction of paid-in capital up to the prorata amount represented by the acquired shares, whether or not such shares are reissuable." [23]

[21] Hale, 58 *Journal of Accountancy* 314.
[22] Bowles, 58 *Journal of Accountancy* 104; Rorem, 12 *Accounting Review* 137.
[23] American Accounting Association, Executive Committee, 23 *Accounting Review* 339.

The Securities and Exchange Commission, on the other hand, now provides that "reacquired shares shall be shown separately as a deduction from capital shares, or from the total of capital shares and surplus, or from surplus, at either par or stated value, or cost, as circumstances require." [24]

*Statistics as to treasury stock on balance sheet.* The trend in recent years has been away from showing treasury stock as an asset, as indicated in the table below: [25]

| | 1935 | 1936 | 1937 | 1938 | 1939 | 1940 |
|---|---|---|---|---|---|---|
| Frequency of treasury stock as asset . . | 218 | 190 | 171 | 154 | 132 | 75 |
| Frequency of treasury stock as deduction from capital stock . . . . . | 673 | 618 | 653 | 663 | 665 | 804 |
| Total number of corporations . . . . | 891 | 808 | 824 | 817 | 797 | 879 |

Some more recent data follow: [26]

| 1947 | 1946 | |
|---|---|---|
| 127 | 127 | Deducted from issued stock of same class |
| | | (67) At par or stated value — aggregate dollar amount of treasury stock not stated |
| | | (43) At par or stated value — aggregate amount stated |
| | | (10) At cost (no par or stated value) (Allis Chalmers Mfg. Co.) |
| | | (4) Par or stated not shown — aggregate amount not stated |
| | | (2) Par or stated not shown — amount (aggregate) shown (Bethlehem Steel Co.) |
| | | (1) Carried at no value (Continental Oil Co.) |
| 85 | 72 | Deducted from total of capital stock and surplus |
| | | (69) At cost (Corn Products Refining Co. — preferred and common separate) |
| | | (6) At par or stated value |
| | | (6) Basis not stated (no par or nominal value stated) |
| | | (2) Below cost — at cost less reserve (Harbison Walker Refractories Inc.; Quaker Oats Co.) |
| | | (1) Quote market (Consolidated Vultee Aircraft Corporation) |
| | | (1) At reduced amount (First National Stores Inc.) |
| 9 | 13 | Deducted from earned surplus |
| | | (5) At cost (General Baking Co.) |
| | | (2) At par (American Bank Note Co.) |
| | | (1) At book value (F. W. Woolworth Co.) |
| | | (1) At stated value (Arundel Co.) |
| 2 | .. | Deducted from total of capital surplus and earned surplus (Glidden Co.) |
| 5 | .. | Parenthetical reference on the balance sheet to treasury stock with some indication of direct charge to earned surplus |

[24] *Regulation S-X*, Rule 3.16.

[25] *Statistics of American Listed Corporations*, Part 2, Prepared by Works Progress Administration, Sponsored by Securities and Exchange Commission, p. 64.

[26] *Accounting Trends in Corporate Reports, 1949*, American Institute of Accountants, p. 53 (quoted by permission).

| | | |
|---|---|---|
| 2 | 1 | Deducted from "capital in excess of stated amount" (U.S. Steel Corp.) |
| 1 | .. | Deducted from total of preferred and common stock (Associated Dry Goods Corp.) |
| 1 | .. | Deducted from total of capital stock and capital surplus (Sinclair Oil Co.) |
| 7 | 7 | Shown as an asset — reason stated |
| 6 | 4 | Shown as an asset — reason not stated |

**Journalization of treasury stock — introductory.** As in the case of the presentation of treasury stock on the balance sheet, the procedure for journalizing reacquired shares has been the subject of much controversy among accountants. The questions which arise are: (1) Do treasury stock transactions give rise to losses and gains? (2) If treasury shares are not to be handled as ordinary purchases and sales, at what time is the equity adjustment to be recognized in the accounts? (3) Is contributed capital to be distinguished on the corporation's books by classes of shares? (4) Does the acquisition of treasury shares give rise to possible asset revaluation? (5) Does it make any difference if the reacquired shares are not legally reissuable?

1. *Comparison of treasury stock transactions with usual losses and gains.* Some accountants from time to time have insisted that the buying and selling of treasury stock should be reported in the same manner as ordinary assets are handled.[27]

This conclusion is derived from the asset theory of treasury stock, and at first glance the average controller or business executive would find it a reasonable viewpoint. For example, if a treasurer of a corporation were instructed to invest some idle cash in securities, and after some investigation he decided to invest in the corporation's own stock, he would probably reason to himself that not to treat the treasury shares as an asset would seriously change the current ratio presented by the balance sheet. In his own mind his position would be further strengthened by the regulations of the Bureau of Internal Revenue which have provided since 1934 that "if a corporation deals in its own shares as it might in the shares of another corporation, the resulting gain or loss is to be computed in the same manner as though the corporation were dealing in the shares of another. So also if the corporation receives its own stock as consideration upon the sale of property by it, or in satisfaction of indebtedness to it, the gain or loss resulting is to be computed in the same manner as though the payment had been made in any other stock. Any gain derived from such transactions is subject to tax, and any loss sustained is allowable as a deduction where permitted by the provisions of the Act." [28] If the treas-

[27] Notably, Montgomery, 65 *Journal of Accountancy* 466.
[28] Regulations 111, Section 29.22(a)–15.

ury stock is not dealt in as the stock of another corporation, there is no taxable gain or loss involved. Each case requires its own proof.[29]

While there is some appeal in the proposition that treasury stock is similar to other investments, the emphasis remains that the business of the corporation is to attempt to make a profit with dealings with nonstockholders. This is the traditional viewpoint as to the purpose of the private corporation; gains and losses are, therefore, ruled out in handling transactions involving reacquired shares. In addition, the corporation "has a commonly recognized moral obligation" of maintaining its contributed capital.[30] In order to accomplish this the so-called gains on treasury stock would necessarily have to be credited to some account representing contributed capital, rather than earned surplus. Another rebuttal often made to the "gain and loss" viewpoint is that the only important difference between reacquired stock and unissued stock is the transitional or suspensive status of the former,[31] and it is certainly a settled matter in accounting and law that profits are not reported on disposal of unissued stock. Occasionally, the suggestion is made that unusual circumstances may create possibilities for making exception to the nongain-or-loss conclusion. These exceptions are (1) where the "profits or losses occur in small amounts," [32] (2) where there is a firm intention to reissue the shares, and (3) holding of shares for a sinking fund or employee trust fund. In spite of these special circumstances, the present authors view the correct reporting of contributed capital of such importance as to negate any advantages which might adhere to the "gain or loss" viewpoint.

2. *Timing of equity adjustment.* Assuming that the reacquisition and disposal of shares are not to be reflected in current profit and loss, the question of the timing of the equity adjustment becomes significant. The first possibility is to recognize the adjustment at the time of acquisition [33] regardless of whether the shares are reissuable or not reissuable. In the opinion of the authors this represents an appropriate conclusion, in that the acquisition of the shares effects a retirement of the stockholder from the corporation (insofar as the treasury shares are concerned).[34]

The second possibility is to recognize the adjustment of equity only at the time of disposal of the treasury shares by the corporation (i.e., canceled, sold, or given away).[35] In this instance the reacquired shares are

[29] See, for example, *Twin Coach Co. v. Gentsch*, 34 AFTR 1708.
[30] (1945) Leland, Ch. 4, p. 7.
[31] *Borg v. International Silver Co.*, 11 Fed. (2nd) 147.
[32] (1938) Sanders-Hatfield-Moore 90.
[33] Rankin, 15 *Accounting Review* 71–77; American Accounting Association, Executive Committee, 23 *Accounting Review* 339.
[34] (1940) Paton-Littleton 115.
[35] (1945) Leland, Ch. 4, p. 6.

recorded at cost and shown on the balance sheet (pending disposal) as a subtraction from the aggregate proprietary capital — see preceding section.

The third and last possibility is to vary the timing of the equity adjustment depending upon whether the reacquired stock is reissuable or nonreissuable. If it is reissuable, the stock is recorded at cost at the time of acquirement, while if it is nonreissuable an equity adjustment is made immediately upon acquisition.[36]

3. *Distinguishing contributed capital by classes of stock.* The question of the accounting importance of distinguishing contributed or invested capital by classes of stock has been seriously considered by accountants for many decades. Varying practices and ideas have been adopted. Practically all accountants agree that it is desirable to segregate on the books by classes of stock the par values of par stocks, and the stated or consideration-received values of no-par stocks. When it comes to the contributed capital occasioned by premiums paid in, or other sums in excess of par or stated values, however, the same degree of unanimity does not prevail. Some accountants contend, for example, that the contributions of each class of stockholders need not be segregated, and that the excesses over par or stated values are just one big "grand" sum which may indiscriminately be utilized for all kinds of adjustments and realignments not only intraclass but also interclass.[37] This may be called the "entity equity" theory.[38]

The opposing viewpoint (called the "issue equity" theory [39]) is that it is just as important to account for the actual contribution of each class as it is for the par or stated value, and that an undifferentiated account fails to indicate historical facts which may be of significance in determining equity problems such as whether "capital contributed by one class of shares has been paid out to another class of shares." [40] Most accountants, therefore, view the matter as one of adequate reporting of the corporate proprietary elements. Depending upon state statutes there may be no legal reason for maintaining the accounting distinction, but it would always have historical significance.[41]

In connection with treasury stock journalization, the decision of making a distinction or not making a distinction must be met in instances such as the following: A corporation sells 20 shares of $100 par preferred stock at 101, and 10 shares of $50 par common stock at 60. During the succeeding year operating profits are earned amounting to $500. A few days later

[36] (1940) Paton-Littleton 115; (1947) Langer, Lecture 8, pp. 2–3.
[37] See, for example, Broad, 17 *Accounting Review* 28.
[38] (1947) Langer, Lecture 6, pp. 1–2.
[39] *Ibid.*, p. 2.
[40] Werntz, 17 *Accounting Review* 38; (1943) Paton 1010.
[41] American Accounting Association, Executive Committee, 17 *Accounting Review* 65.

the corporation reacquires 5 shares of preferred stock at 108. Query: To what account (or accounts) is the excess of $8 per share, over par, paid for the treasury preferred stock to be charged, assuming an equity adjustment is to be made at acquisition? Some of the possible entries are:

(1–a)

| | | |
|---|---|---|
| Treasury Stock — Preferred | $500 | |
| Paid-in Surplus (From Present Preferred Stockholders) | 20 | |
| Paid-in Surplus (From Present Common Stockholders) | 20 | |
| Cash | | $540 |

To record purchase of 5 shares of preferred treasury stock, assuming no distinction is to be made as to class of stock contributed capital.

Or, (1–b)

| | | |
|---|---|---|
| Treasury Stock — Preferred | 500 | |
| Paid-in Surplus (From Present Preferred Stockholders) | 20 | |
| Earned Surplus | 20 | |
| Cash | | 540 |

To record purchase of 5 shares of preferred treasury stock, assuming a distinction is to be made as to class of stock contributed capital. The $20 charge to Earned Surplus is made on the theory that it represents a corporate distribution, or a donation, to the party transferring the 5 shares to the corporation.

Or, (1–c)

| | | |
|---|---|---|
| Treasury Stock — Preferred | 500 | |
| Paid-in Surplus (From Present Preferred Stockholders) | 5 | |
| Earned Surplus | 35 | |
| Cash | | 540 |

To record purchase of 5 shares of preferred treasury stock, assuming (1) a distinction is to be made as to class of stock contributed capital and (2) the "capital paid in on a given class of stock applies prorata to each issue share (including those in the treasury) of the same class."[42]

Or, (1–d)

| | | |
|---|---|---|
| Treasury Stock — Preferred | 500 | |
| Paid-in Surplus (From Present Preferred Stockholders) | 5 | |
| Deferred Premium on Preferred Treasury Stock | 35 | |
| Cash | | 540 |

To record purchase of 5 shares of preferred treasury stock, assuming (1) a distinction is to be made as to class of stock contributed capital and (2) the "premium" of $35 is to be deferred pending resale of the treasury stock; or, if the treasury shares are retired, the $35 will be periodically amortized against earned surplus.[43] In the meantime the $35 is handled on the balance sheet as an unallocated deduction from the proprietary capital.

As indicated in Chapter 2 the present authors believe that Entry 1–c given above reflects clearly the financial facts to be reported, since it preserves the stock-class distinction between contributed and accumulated

[42] (1945) Leland, Ch. 4, p. 6.
[43] May, 72 *Journal of Accountancy* 127; Werntz, 17 *Accounting Review* 40.

capital. One authority has noted, however, that "the relationship between a corporation and its stockholders is a contractual one, and the question of the treatment of paid-in surplus as a credit to the equity of a class of stockholders or of all the stockholders may be resolved by agreement." [44] The question of "securing the consent" of the classes of stockholders as to any certain treatment also enters. This may possibly have a bearing on the decision, but it is definitely not a cure-all.[45] The accounting importance of adequate disclosure still remains.

4. *Purchase of treasury stock in relation to possible asset revaluation.* The suggestion has been advanced by at least one accountant that the acquisition of treasury shares by purchase offers an opportunity for revaluation of the entity resources, if the purchase price differs from the book value associated with the reacquired shares.[46] For example, if a corporation has a book proprietary capital of $10,000, and if it repurchases 20 per cent of its shares for $1,500 it would appear that there is an unrecognized and unrecorded decrease of [$10,000 − ($1,500 ÷ .20)] or $2,500 in the going-concern value of the corporate assets. Since the reacquired stock amounted to only 20 per cent, however, (.20 × $2,500) or $500 would be recorded in a possible Reserve for Overvaluation of Assets account. While it is entirely unlikely that this suggestion will receive support as a practical proposition, it does focus attention on "the folly of assuming that any income can arise through the act of acquiring shares at less than recorded book value at date of acquisition." [47]

5. *Distinction between reissuable and nonreissuable treasury shares.* Sometimes treasury shares are acquired which are not reissuable, either by contract or by statute. The question arises as to whether this is a material fact sufficient to change the nature of the entry made at the time of acquisition. As stated in a previous paragraph of this section, the present writers prefer to make the same entry at acquisition, regardless of the issuability of the treasury shares. This conclusion provides a consistent explanation of the nature of the transactions involved in purchasing of treasury stock on the one hand, and its subsequent cancellation or resale on the other hand. It implies (1) that treasury shares are closely akin to unissued shares, and (2) that the acquisition of the shares by the corporation breaks off the previously existing relationship between the entity and the stockholder. There is, however, considerable authority to the contrary.[48]

*Recommended entries.* In order to present to the student the entries recommended by the present authors for handling purchased par value treasury

[44] (1947) Langer, Lecture 6, p. 2; see also the discussion in (1944) Sunley-Carter 74–82.
[45] Werntz, 17 *Accounting Review* 38.
[46] Hord, 14 *Accounting Review* 272.
[47] (1945) Leland, Ch. 2, p. 23.
[48] (1940) Paton-Littleton 115.

stock, the following illustrative problem (and solution) is given. The entries in the solution are predicated upon the following premises:

1. The distinction between contributed and accumulated capital (from non-owners) must be maintained.
2. The amount of contributed capital not accounted for in the capital stock accounts must be analyzed to show the capital contributed by the present holders of outstanding shares by classes of stock and the capital contributed by past holders of reacquired shares (this kind of contributed capital need not be analyzed by classes of stock).
3. The "issue equity" theory of contributed capital stock is to be followed. If the par value stock is recorded at par at date of acquisition, the correct analysis of the purchase price should be made at that time. If treasury stock is recorded at cost at date of acquisition, the final results when reissued must be the same as though the treasury stock had been recorded initially at par. The principle of identifying treasury stock sold to the blocks of treasury stock acquired should be followed.
4. As the premium and discount on (a) original issues of stock, (b) treasury stock purchased, and (c) treasury stock sold, and the so-called "profits and losses" on treasury stock transactions are all elements of contributed capital, they must be analyzed according to (2) above.
5. When treasury shares are acquired by purchase or nonprorata donations from stockholders, a prorata portion of the paid-in surplus applicable to each outstanding share of that issue should be retired, and any excess of the redemption price over the par value and the retired paid-in surplus of the reacquired shares may be charged against either the paid-in surplus contributed by past holders of reacquired shares or accumulated capital (from non-owners).[49] If the par value and the retired paid-in surplus of the reacquired shares exceeds the redemption price, the excess constitutes paid-in surplus contributed by past holders of reacquired shares.
6. Treasury shares donated proratably by stockholders are so close to being stock assessments that the only kind of surplus they should affect is the paid-in surplus from present stockholders.

When par value treasury stock acquired by purchase or nonprorata donations by stockholders, originally recorded at cost, is sold or canceled, the journal entry may be determined as follows:

1. Debit Cash account for money received if stock is sold, or debit Par Value Capital Stock account at the par value of the disposed-of shares if the stock is canceled;
2. Credit Treasury Stock account for cost of shares sold or canceled;
3. Credit Paid-in Surplus (Miscellaneous) account for excess of total contributed capital pertaining to the disposed-of shares at date of their acquisition over the cost thereof, or debit either Earned Surplus account or Paid-in Surplus (Miscellaneous) account for the excess of the cost of the disposed-of shares over the total contributed capital pertaining to the disposed-of shares at date of their acquisition;
4. Balance the entry (a) by crediting Paid-in Surplus (From Present Stockholders) account for the product of the number of shares sold or canceled multiplied by the excess of the resale price per share sold or the par value of each canceled

[49] S.E.C. *Accounting Series Release No. 45* (quoted in full pp. 101–102).

share over the prorata contributed capital per share at date of acquisition of the disposed-of treasury stock or (b) by debiting Paid-in Surplus (From Present Stockholders) account for the product of the number of shares sold or canceled multiplied by the excess of the prorata contributed capital per share at date of acquisition of the disposed-of treasury stock over the resale price per share sold or the par value of each canceled share.

### *Illustrative Problem*

A corporation issues 100 shares of capital stock, par value $100 each, at 105. Give the journal entries for the treasury stock transactions occurring after $5,000 operating profits have been made under the following independent cases:

Case A. 10 shares are bought at 104, then 6 shares are sold at 106, and later 4 shares are sold at 102.

Case B. 25 shares are bought at 150 and retired.

Case C. 25 shares are bought at 150 and later sold at 136.

Case D. 20 shares are bought at 90 and later sold at 92.

Case E. 40 shares are bought at 95 and later sold at 75; later the 40 shares are repurchased at 90 and canceled.

Case F. 10 shares are donated by the president and sold at 106.

Case G. Each stockholder donated 10 per cent of his holdings and the shares were sold at 106.

### *Annotated Solution*

(NOTE: Since some accountants prefer to record treasury stock at cost, the solution given below presents alternative journal entries. The present writers recommend, however, the use of the par value method.)

| ALL CASES | When treasury stock is recorded under Par value method | | When treasury stock is recorded under Cost price method | |
|---|---|---|---|---|
| Cash | $10,500 | ..... | $10,500 | ..... |
| Par Value Capital Stock | ..... | $10,000 | ..... | $10,000 |
| Paid-in Surplus (From Present Stockholders) | ..... | 500 | ..... | 500 |
| For original sale of 100 shares. | | | | |
| Cash (or Current Assets) | 5,000 | ..... | 5,000 | ..... |
| Earned Surplus | ..... | 5,000 | ..... | 5,000 |
| For operating profits. | | | | |
| CASE A | | | | |
| Treasury Stock | $ 1,000 | ..... | $ 1,040 | ..... |
| Paid-in Surplus (From Present Stockholders) | 50 | ..... | ..... | ..... |
| Cash | ..... | $ 1,040 | ..... | $ 1,040 |
| Paid-in Surplus (Miscellaneous) | ..... | 10 | ..... | ..... |
| For 10 shares purchased. | | | | |
| Cash (or Current Assets) | 636 | ..... | 636 | ..... |
| Treasury Stock | ..... | 600 | ..... | 624 |
| Paid-in Surplus (From Present Stockholders) | ..... | 36 | ..... | 6 |
| Paid-in Surplus (Miscellaneous) | ..... | ..... | ..... | 6 |
| For 6 shares sold. | | | | |

| | When treasury stock is recorded under | | | |
|---|---|---|---|---|
| | Par value method | | Cost price method | |
| Cash (or Current Assets) | $ 408 | | $ 408 | |
| Paid-in Surplus (From Present Stockholders) | | | 12 | |
| Treasury Stock | | $ 400 | | $ 416 |
| Paid-in Surplus (From Present Stockholders) | | 8 | | |
| Paid-in Surplus (Miscellaneous) | | | | 4 |
| For 4 shares sold. | | | | |
| CASE B | | | | |
| Treasury Stock | $ 2,500 | | $ 3,750 | |
| Paid-in Surplus (From Present Stockholders) | 125 | | | |
| Earned Surplus | 1,125 | | | |
| Cash | | $ 3,750 | | $ 3,750 |
| For 25 shares purchased. | | | | |
| Capital Stock | 2,500 | | 2,500 | |
| Paid-in Surplus (From Present Stockholders) | | | 125 | |
| Earned Surplus | | | 1,125 | |
| Treasury Stock | | 2,500 | | 3,750 |
| For 25 shares retired. | | | | |
| CASE C | | | | |
| Treasury Stock | $ 2,500 | | $ 3,750 | |
| Paid-in Surplus (From Present Stockholders) | 125 | | | |
| Earned Surplus | 1,125 | | | |
| Cash | | $ 3,750 | | $ 3,750 |
| For 25 shares purchased. | | | | |
| Cash | 3,400 | | 3,400 | |
| Earned Surplus | | | 1,125 | |
| Treasury Stock | | 2,500 | | 3,750 |
| Paid-in Surplus (From Present Stockholders) | | 900 | | 775 |
| For 25 shares reissued. | | | | |
| CASE D | | | | |
| Treasury Stock | $ 2,000 | | $ 1,800 | |
| Paid-in Surplus (From Present Stockholders) | 100 | | | |
| Cash | | $ 1,800 | | $ 1,800 |
| Paid-in Surplus (Miscellaneous) | | 300 | | |
| For 20 shares purchased. | | | | |
| Cash | 1,840 | | 1,840 | |
| Paid-in Surplus (From Present Stockholders) | 160 | | 260 | |
| Treasury Stock | | 2,000 | | 1,800 |
| Paid-in Surplus (Miscellaneous) | | | | 300 |
| For 20 shares reissued. | | | | |

| | When treasury stock is recorded under | | | |
|---|---|---|---|---|
| | Par value method | | Cost price method | |
| CASE E | | | | |
| Treasury Stock | $ 4,000 | ..... | $ 3,800 | ..... |
| Paid-in Surplus (From Present Stockholders) | 200 | ..... | ..... | ..... |
| Cash | ..... | $ 3,800 | ..... | $ 3,800 |
| Paid-in Surplus (Miscellaneous) | ..... | 400 | ..... | ..... |
| For 40 shares purchased. | | | | |
| Cash | 3,000 | ..... | 3,000 | ..... |
| Paid-in Surplus (From Present Stockholders) | 1,000 | ..... | 1,200 | ..... |
| Treasury Stock | ..... | 4,000 | ..... | 3,800 |
| Paid-in Surplus (Miscellaneous) | ..... | ..... | ..... | 400 |
| For 40 shares reissued. | | | | |
| Treasury Stock | 4,000 | ..... | 3,600 | ..... |
| Cash | ..... | 3,600 | ..... | 3,600 |
| Paid-in Surplus (From Present Stockholders) | ..... | 280*a* | ..... | ..... |
| Paid-in Surplus (Miscellaneous) | ..... | 120 | ..... | ..... |
| For 40 shares repurchased. | | | | |
| *a*. Paid-in Surplus (From Present Stockholders) has a debit balance of $7 per share; 40 × $7 = $280. | | | | |
| Par Value Capital Stock | 4,000 | ..... | 4,000 | ..... |
| Treasury Stock | ..... | 4,000 | ..... | 3,600 |
| Paid-in Surplus (From Present Stockholders) | ..... | ..... | ..... | 280 |
| Paid-in Surplus (Miscellaneous) | ..... | ..... | ..... | 120 |
| For 40 shares retired. | | | | |
| CASE F | | | | |
| Treasury Stock | $ 1,000 | ..... | ..... | ..... |
| Paid-in Surplus (From Present Stockholders) | 50 | ..... | ..... | ..... |
| Paid-in Surplus (Miscellaneous) | ..... | $ 1,050 | ..... | ..... |
| For 10 shares donated. | | | | |
| Cash | 1,060 | ..... | $ 1,060 | ..... |
| Treasury Stock | ..... | 1,000 | ..... | ..... |
| Paid-in Surplus (From Present Stockholders) | ..... | 60 | ..... | $ 10 |
| Paid-in Surplus (Miscellaneous) | ..... | ..... | ..... | 1,050 |
| For 10 shares sold. | | | | |
| CASE G | | | | |
| Treasury Stock | $ 1,000 | ..... | ..... | ..... |
| Paid-in Surplus (From Present Stockholders) | ..... | $ 1,000 | ..... | ..... |
| For 10% donation from all stockholders. | | | | |
| Cash | 1,060 | ..... | $ 1,060 | ..... |
| Treasury Stock | ..... | 1,000 | ..... | ..... |
| Paid-in Surplus (From Present Stockholders) | ..... | 60 | ..... | $ 1,060 |
| For 10 shares sold. | | | | |

The reconciliation given on page 86 shows that both methods of recording treasury par value stock give identical final results.

**Reconciliation of Proprietorship Accounts**

| Treasury Shares Recorded at Par | | | | | Treasury Shares Recorded at Cost | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Paid-in Surplus | | | | | Paid-in Surplus | |
| Capital Stock Dr.*; Cr. | Treasury Stock Dr.*; Cr. | Earned Surplus Dr.*; Cr. | From Present Stock-Holders Dr.*; Cr. | Miscellaneous Dr.*; Cr. | Capital Stock Dr.*; Cr. | Treasury Stock Dr.*; Cr. | Earned Surplus Dr.*; Cr. | From Present Stock-Holders Dr.*; Cr. | Miscellaneous Dr.*; Cr. |
| | | | | CASE A | | | | | |
| $10,000 | $1,000* | $5,000 | $ 500 | $ 10 | $10,000 | $1,040* | $5,000 | $ 500 | $ 6 |
| | 600 | | 50* | | | 624 | | 6 | 4 |
| | 400 | | 36 | | | 416 | | 12* | |
| | | | 8 | | | | | | |
| $10,000 | ..... | $5,000 | $ 494 | $ 10 | $10,000 | ..... | $5,000 | $ 494 | $ 10 |
| | | | | CASE B | | | | | |
| $10,000 | $2,500* | $5,000 | $ 500 | | $10,000 | $3,750* | $5,000 | $ 500 | |
| 2,500* | 2,500 | 1,125* | 125* | | 2,500* | 3,750 | 1,125* | 125* | |
| $ 7,500 | ..... | $3,875 | $ 375 | ..... | $ 7,500 | ..... | $3,875 | $ 375 | ..... |
| | | | | CASE C | | | | | |
| $10,000 | $2,500* | $5,000 | $ 500 | | $10,000 | $3,750* | $5,000 | $ 500 | |
| | 2,500 | 1,125* | 125* | | | 3,750 | 1,125* | 775 | |
| | | | 900 | | | | | | |
| $10,000 | ..... | $3,875 | $1,275 | ..... | $10,000 | ..... | $3,875 | $1,275 | ..... |
| | | | | CASE D | | | | | |
| $10,000 | $2,000* | $5,000 | $ 500 | $ 300 | $10,000 | $1,800* | $5,000 | $ 500 | $ 300 |
| | 2,000 | | 100* | | | 1,800 | | 260* | |
| | | | 160* | | | | | | |
| $10,000 | ..... | $5,000 | $ 240 | $ 300 | $10,000 | ..... | $5,000 | $ 240 | $ 300 |
| | | | | CASE E | | | | | |
| $10,000 | $4,000* | $5,000 | $ 500 | $ 400 | $10,000 | $3,800* | $5,000 | $ 500 | $ 400 |
| 4,000* | 4,000 | | 200* | 120 | 4,000* | 3,800 | | 1,200* | 120 |
| | 4,000* | | 1,000* | | | 3,600* | | 280 | |
| | 4,000 | | 280 | | | 3,600 | | | |
| $ 6,000 | ..... | $5,000 | $ 420* | $ 520 | $ 6,000 | ..... | $5,000 | $ 420* | $ 520 |
| | | | | CASE F | | | | | |
| $10,000 | $1,000* | $5,000 | $ 500 | $1,050 | $10,000 | | $5,000 | $ 500 | $1,050 |
| | 1,000 | | 50* | | | | | 10 | |
| | | | 60 | | | | | | |
| $10,000 | ..... | $5,000 | $ 510 | $1,050 | $10,000 | ..... | $5,000 | $ 510 | $1,050 |
| | | | | CASE G | | | | | |
| $10,000 | $1,000* | $5,000 | $ 500 | | $10,000 | | $5,000 | $ 500 | |
| | 1,000 | | 1,000 | | | | | 1,060 | |
| | | | 60 | | | | | | |
| $10,000 | ..... | $5,000 | $1,560 | ..... | $10,000 | ..... | $5,000 | $1,560 | ..... |

**Entries for purchased no-par treasury stock.** Much of the discussion given on preceding pages of this chapter is equally applicable to no-par stock. The problem of journalization is complicated, however, by the fact that no-par stock, when originally issued, may be recorded at a stated value per share or at the amount of the consideration received. When the

shares are reacquired, the entries to be made will vary to some extent depending upon the method adopted in recording the original issue.

If the consideration-received technique was used in journalizing the sale of the stock, and if the issue price varied as between different purchasers of the original shares, a decision must be made (in handling the treasury stock) in regard to whether to record the reacquired shares at (1) the original issue price, or (2) at the average issue price of all the shares outstanding. In regard to the final decision, in some instances it may be impossible to determine the original issue price of the treasury shares purchased, as the shares issued at varying amounts may have been merged into one certificate and later reissued in several different certificates. The present authors favor the average issue technique, as it is (1) readily calculated and (2) follows the equity principle that all shares of a class are identical from the standpoint of possible dividend preferences, liquidation preferences, voting power, etc.[50] If no-par stock is handled under the consideration-received method, the Paid-in Surplus (From Present Stockholders) account is combined with the No-par Capital Stock account, although the Paid-in Surplus (Miscellaneous) account may still be used.

If, on the other hand, the stated value technique was used in journalizing the sale of the original stock, the treasury shares may be brought on the books at such stated value, the latter being treated as an "unofficial" par value (see illustrative problem below).

*Recommended entries.* The recommended entries for purchased no-par stock are developed below upon the same premises concerning contributed capital as were the recommended entries for purchased par value shares given in the preceding section. Since some accountants, however, prefer to record treasury stock at cost, the solution presented to the illustrative problem shows the entries under the cost price method as an alternate technique.

When no-par treasury stock acquired by purchase or nonprorata donations by stockholders, originally recorded at cost, is sold or canceled, the journal entry may be determined according to the rule given on pages 82–83 for par value treasury stock, subject to the following modifications:

1. If the no-par stock is handled under the stated value method, treat the stated value as though it were the par value of the stock and add "No-par" to the title of the Capital Stock and Treasury Stock accounts.

2. If the no-par stock is handled under the consideration-received method, the rule should be restated as follows:

a. Debit Cash account for money received if stock is sold, or debit No-par Capital Stock account for canceled shares' prorata portion of the balance of the No-par Capital Stock account at date of acquiring the treasury shares if the stock is canceled;

[50] (1933) Kester 483; (1935) Porter-Fiske 488.

b. Credit No-par Treasury Stock account for cost of shares sold or canceled;

c. Credit Paid-in Surplus (Miscellaneous) account for excess of total contributed capital pertaining to the disposed-of shares at date of their acquisition over the cost thereof, or debit either Earned Surplus or Paid-in Surplus (Miscellaneous) accounts for the excess of the cost of the disposed-of shares over the total contributed capital pertaining to the disposed-of shares at date of their acquisition;

d. Balance the entry (1) by crediting No-par Capital Stock account for the product of the number of shares sold or canceled multiplied by the excess of the resale price per share sold or the canceled shares' prorata portion per share of the balance of the No-par Capital Stock account at date of acquiring the treasury shares over the prorata contributed capital per share at date of acquisition of the disposed-of treasury stock or (2) by debiting No-par Capital Stock account for the product of the number of shares sold or canceled multiplied by the excess of the prorata contributed capital per share at date of acquisition of the disposed-of treasury stock over the resale price per share sold or the canceled shares' prorata portion per share of the balance of the No-par Capital Stock account at date of acquiring the treasury shares.

### *Illustrative Problem*

A corporation issues 100 no-par shares at 105. Give the journal entries for the treasury stock transactions occurring after $5,000 operating profits have been made under the following independent cases:

Case A. 10 shares are bought at 104, then 6 shares are sold at 106, and later 4 shares are sold at 102.

Case B. 25 shares are bought at 150 and retired.

Case C. 25 shares are bought at 150 and all resold at 136.

Case D. 20 shares are bought at 90 and later sold at 92.

NOTE. Use $100 as stated value for entries under the stated value method.

*Solution*

(When cost of treasury stock is analyzed at date of acquisition)

| ALL CASES | When no-par stock is recorded under Stated value method | | Consideration-received method | |
|---|---|---|---|---|
| Cash | $10,500 | ..... | $10,500 | ..... |
| No-par Capital Stock | ..... | $10,000 | ..... | $10,500 |
| Paid-in Surplus (From Present Stockholders) | ..... | 500 | ..... | ..... |
| For original sale of 100 shares. | | | | |
| Cash (or Current Assets) | 5,000 | ..... | 5,000 | ..... |
| Earned Surplus | ..... | 5,000 | ..... | 5,000 |
| For operating profits. | | | | |
| CASE A | | | | |
| No-par Treasury Stock | $ 1,000 | ..... | $ 1,050 | ..... |
| Paid-in Surplus (From Present Stockholders) | 50 | ..... | ..... | ..... |
| Paid-in Surplus (Miscellaneous) | ..... | $ 10 | ..... | $ 10 |
| Cash | ..... | 1,040 | ..... | 1,040 |
| For 10 shares purchased. | | | | |

| | When no-par stock is recorded under Stated value method | | Consideration-received method | |
|---|---|---|---|---|
| Cash | $ 636 | ..... | $ 636 | ..... |
| No-par Treasury Stock | ..... | $ 600 | ..... | $ 630 |
| Paid-in Surplus (From Present Stockholders) | ..... | 36 | ..... | ..... |
| No-par Capital Stock | ..... | ..... | ..... | 6 |
| For 6 shares sold. | | | | |
| Cash | 408 | ..... | 408 | ..... |
| No-par Capital Stock | ..... | ..... | 12 | ..... |
| No-par Treasury Stock | ..... | 400 | ..... | 420 |
| Paid-in Surplus (From Present Stockholders) | ..... | 8 | ..... | ..... |
| For 4 shares sold. | | | | |
| CASE B | | | | |
| No-par Treasury Stock | $ 2,500 | ..... | $ 2,625 | ..... |
| Paid-in Surplus (From Present Stockholders) | 125 | ..... | ..... | ..... |
| Earned Surplus | 1,125 | ..... | 1,125 | ..... |
| Cash | ..... | $ 3,750 | ..... | $ 3,750 |
| For 25 shares purchased. | | | | |
| No-par Capital Stock | 2,500 | ..... | 2,625 | ..... |
| No-par Treasury Stock | ..... | 2,500 | ..... | 2,625 |
| For 25 shares retired. | | | | |
| CASE C | | | | |
| No-par Treasury Stock | $ 2,500 | ..... | $ 2,625 | ..... |
| Paid-in Surplus (From Present Stockholders) | 125 | ..... | ..... | ..... |
| Earned Surplus | 1,125 | ..... | 1,125 | ..... |
| Cash | ..... | $ 3,750 | ..... | $ 3,750 |
| For 25 shares purchased. | | | | |
| Cash | 3,400 | ..... | 3,400 | ..... |
| No-par Treasury Stock | ..... | 2,500 | ..... | 2,625 |
| Paid-in Surplus (From Present Stockholders) | ..... | 900 | ..... | ..... |
| No-par Capital Stock | ..... | ..... | ..... | 775 |
| For 25 shares sold. | | | | |
| CASE D | | | | |
| No-par Treasury Stock | $ 2,000 | ..... | $ 2,100 | ..... |
| Paid-in Surplus (From Present Stockholders) | 100 | ..... | ..... | ..... |
| Paid-in Surplus (Miscellaneous) | ..... | $ 300 | ..... | $ 300 |
| Cash | ..... | 1,800 | ..... | 1,800 |
| For 20 shares purchased. | | | | |
| Cash | 1,840 | ..... | 1,840 | ..... |
| Paid-in Surplus (From Present Stockholders) | 160 | ..... | ..... | ..... |
| No-par Capital Stock | ..... | ..... | 260 | ..... |
| No-par Treasury Stock | ..... | 2,000 | ..... | 2,100 |
| For 20 shares sold. | | | | |

(When treasury stock is recorded at cost)

| All Cases | When no-par stock is recorded under Stated value method | | When no-par stock is recorded under Consideration-received method | |
|---|---|---|---|---|
| Cash | $10,500 | ..... | $10,500 | ..... |
| No-par Capital Stock | ..... | $10,000 | ..... | $10,500 |
| Paid-in Surplus (From Present Stockholders) | ..... | 500 | ..... | ..... |
| For original sale of 100 shares. | | | | |
| Cash (or Current Assets) | 5,000 | ..... | 5,000 | ..... |
| Earned Surplus | ..... | 5,000 | ..... | 5,000 |
| For operating profits. | | | | |
| **Case A** | | | | |
| No-par Treasury Stock | $ 1,040 | ..... | $ 1,040 | ..... |
| Cash | ..... | $ 1,040 | ..... | $ 1,040 |
| For 10 shares purchased. | | | | |
| Cash | 636 | ..... | 636 | ..... |
| No-par Treasury Stock | ..... | 624 | ..... | 624 |
| Paid-in Surplus (Miscellaneous) | ..... | 6 | ..... | 6 |
| Paid-in Surplus (From Present Stockholders) | ..... | 6 | ..... | ..... |
| No-par Capital Stock | ..... | ..... | ..... | 6 |
| For 6 shares sold. | | | | |
| Cash | 408 | ..... | 408 | ..... |
| Paid-in Surplus (From Present Stockholders) | 12 | ..... | ..... | ..... |
| No-par Capital Stock | ..... | ..... | 12 | ..... |
| No-par Treasury Stock | ..... | 416 | ..... | 416 |
| Paid-in Surplus (Miscellaneous) | ..... | 4 | ..... | 4 |
| For 4 shares sold. | | | | |
| **Case B** | | | | |
| No-par Treasury Stock | $ 3,750 | ..... | $ 3,750 | ..... |
| Cash | ..... | $ 3,750 | ..... | $ 3,750 |
| For 25 shares purchased. | | | | |
| No-par Capital Stock | 2,500 | ..... | 2,625 | ..... |
| Paid-in Surplus (From Present Stockholders) | 125 | ..... | ..... | ..... |
| Earned Surplus | 1,125 | ..... | 1,125 | ..... |
| No-par Treasury Stock | ..... | 3,750 | ..... | 3,750 |
| For 25 shares retired. | | | | |
| **Case C** | | | | |
| No-par Treasury Stock | $ 3,750 | ..... | $ 3,750 | ..... |
| Cash | ..... | $ 3,750 | ..... | $ 3,750 |
| For 25 shares purchased. | | | | |
| Cash | 3,400 | ..... | 3,400 | ..... |
| Earned Surplus | 1,125 | ..... | 1,125 | ..... |
| No-par Treasury Stock | ..... | 3,750 | ..... | 3,750 |
| Paid-in Surplus (From Present Stockholders) | ..... | 775 | ..... | ..... |
| No-par Capital Stock | ..... | ..... | ..... | 775 |
| For 25 shares sold. | | | | |

| Case D | When no-par stock is recorded under Stated value method | | Consideration-received method | |
|---|---|---|---|---|
| No-par Treasury Stock | $ 1,800 | ..... | $ 1,800 | ..... |
| Cash | ..... | $ 1,800 | ..... | $ 1,800 |
| For 20 shares purchased. | | | | |
| Cash | 1,840 | ..... | 1,840 | ..... |
| Paid-in Surplus (From Present Stockholders) | 260 | ..... | ..... | ..... |
| No-par Capital Stock | ..... | ..... | 260 | ..... |
| No-par Treasury Stock | ..... | 1,800 | ..... | 1,800 |
| Paid-in Surplus (Miscellaneous) | ..... | 300 | ..... | 300 |
| For 20 shares sold. | | | | |

The reconciliation of the proprietorship accounts on page 92 shows that all the methods give identical final results except the No-par Capital Stock and Paid-in Surplus (From Present Stockholders) accounts are combined into the former account under the consideration-received method.

**Sale of treasury shares purchased at several dates.** In the preceding illustrations, the treasury stock sold was all acquired at the same time in each case. If the shares had been purchased at several dates with varying prices, a choice of a method for pricing out the shares must be made. The three methods ordinarily recommended are: (a) Cost of specific lot sold, (b) the first-in, first-out method, and (c) the average cost method. The (a) method is the most accurate from the standpoint of matching shares sold with shares acquired, but it sometimes proves difficult to apply. In practice, the first-in, first-out method is widely employed.[51]

**Donated treasury stock — general.** The donation of shares arises only at rare intervals. The usual situation is that the corporation, which has only par stock authorized, cannot find a buyer for additional shares at par. In order to avoid having to sell new shares at a discount, certain stockholders may donate some of their present holdings to the corporation. The latter can then legally sell the donated shares at any price which can be obtained without any contingent liability attaching thereto. In the case of no-par stock this procedure is not necessary, yet there have been some cases of no-par shares being donated to the corporation (usually by a stockholder owning a substantial percentage of the shares outstanding) to be resold in order to avoid having to increase the total number of shares issued and outstanding.

Donated shares may be resold or retired as determined by the directors or as agreed upon by contract. Pending a decision on this matter, the shares are retained in the accounts either on a memo basis or by means of

[51] This is the method required by the Bureau of Internal Revenue if specific lots are not identified. Regulations 111, Section 29.22(a)–8.

## Reconciliation of Proprietorship Accounts

| Under Stated Value Method | | | | | Under Consideration-Received Method | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Paid-in Surplus | | | | | |
| No-par Capital Stock Dr.*; Cr. | No-par Treasury Stock Dr.*; Cr. | Earned Surplus Dr.*; Cr. | From Present Stock-holders Dr.*; Cr. | Miscel-laneous Dr.*; Cr. | No-par Capital Stock Dr.*; Cr. | No-par Treasury Stock Dr.*; Cr. | Earned Surplus Dr.*; Cr. | Paid-in Surplus Miscel-laneous Dr.*; Cr. |
| | | | CASE A | | | | | |
| | | | (When treasury stock is analyzed at acquisition) | | | | | |
| $10,000 | $1,000* | $5,000 | $ 500 | $ 10 | $10,500 | $1,050* | $5,000 | $ 10 |
| | 600 | | 50* | | 6 | 630 | | |
| | 400 | | 36 | | 12* | 420 | | |
| | | | 8 | | | | | |
| $10,000 | ..... | $5,000 | $ 494 | $ 10 | $10,494 | ..... | $5,000 | $ 10 |
| | | | (When treasury stock is recorded at cost) | | | | | |
| $10,000 | $1,040* | $5,000 | $ 500 | $ 6 | $10,500 | $1,040* | $5,000 | $ 6 |
| | 624 | | 6 | 4 | 6 | 624 | | 4 |
| | 416 | | 12* | | 12* | 416 | | |
| $10,000 | ..... | $5,000 | $ 494 | $ 10 | $10,494 | ..... | $5,000 | $ 10 |
| | | | CASE B | | | | | |
| | | | (When treasury stock is analyzed at acquisition) | | | | | |
| $10,000 | $2,500* | $5,000 | $ 500 | | $10,500 | $2,625* | $5,000 | |
| 2,500* | 2,500 | 1,125* | 125* | | 2,625* | 2,625 | 1,125* | |
| $ 7,500 | ..... | $3,875 | $ 375 | .... | $ 7,875 | ..... | $3,875 | .... |
| | | | (When treasury stock is recorded at cost) | | | | | |
| $10,000 | $3,750* | $5,000 | $ 500 | | $10,500 | $3,750* | $5,000 | |
| 2,500* | 3,750 | 1,125* | 125* | | 2,625* | 3,750 | 1,125* | |
| $ 7,500 | ..... | $3,875 | $ 375 | .... | $ 7,875 | ..... | $3,875 | .... |
| | | | CASE C | | | | | |
| | | | (When treasury stock is analyzed at acquisition) | | | | | |
| $10,000 | $2,500* | $5,000 | $ 500 | | $10,500 | $2,625* | $5,000 | |
| | 2,500 | 1,125* | 125* | | 775 | 2,625 | 1,125* | |
| | | | 900 | | | | | |
| $10,000 | ..... | $3,875 | $1,275 | .... | $11,275 | ..... | $3,875 | .... |
| | | | (When treasury stock is recorded at cost) | | | | | |
| $10,000 | $3,750* | $5,000 | $ 500 | | $10,500 | $3,750* | $5,000 | |
| | 3,750 | 1,125* | 775 | | 775 | 3,750 | 1,125* | |
| $10,000 | ..... | $3,875 | $1,275 | .... | $11,275 | ..... | $3,875 | .... |
| | | | CASE D | | | | | |
| | | | (When treasury stock is analyzed at acquisition) | | | | | |
| $10,000 | $2,000* | $5,000 | $ 500 | $300 | $10,500 | $2,100* | $5,000 | $300 |
| | 2,000 | | 100* | | 260* | 2,100 | | |
| | | | 160* | | | | | |
| $10,000 | ..... | $5,000 | $ 240 | $300 | $10,240 | ..... | $5,000 | $300 |
| | | | (When treasury stock is recorded at cost) | | | | | |
| $10,000 | $1,800* | $5,000 | $ 500 | $300 | $10,500 | $1,800* | $5,000 | $300 |
| | 1,800 | | 260* | | 260* | 1,800 | | |
| $10,000 | ..... | $5,000 | $ 240 | $300 | $10,240 | ..... | $5,000 | $300 |

a formal entry. Since the legal capital is not affected by the donation of shares and since there has been no outlay of funds or property, some authorities recommend the memo procedure. When the shares are acquired, therefore, a memo is made on the debit side of the Capital Stock account or in the Unissued Capital Stock account. As an alternative procedure the formal-entry method may be adopted. The latter entails the question of placing a dollar value upon the donated shares, and accountants have been perplexed in the past as to an appropriate decision, especially in regard to no-par stock. The Committee on Accounting Procedure of the American Institute of Accountants has expressed its views as follows:

> 6. If capital stock is issued nominally for the acquisition of property and it appears that at about the same time, and pursuant to a previous agreement or understanding, some portion of the stock so issued is donated to the corporation, it is not permissible to treat the par value of the stock nominally issued for the property as the cost of that property. If stock so donated is subsequently sold it is not permissible to treat the proceeds as a credit to surplus of the corporation.[52]

This quotation implies that it is the responsibility of the accountant to look with doubt upon any transactions arising in donated shares if they arise under the conditions stated. The Securities and Exchange Commission has also taken an active interest in the matter and in one decision held that it was misleading to record a considerable amount of donated surplus at the time of organizing a corporation or shortly thereafter.[53]

**Reserve for purchased treasury stock.** As a matter of public policy, and as a protection to corporate creditors, many states limit the extent to which the corporation may reacquire its own stock by purchase. Even where there is no legislative provision the courts of some of the states consider the matter of sufficient public interest to render decisions on the subject. In connection with the question of adequate protection of the creditors, the point arises as to whether the rule should operate for the protection of: (a) Only those creditors existing at the time of the purchases, or (b) only those creditors whose claims arose after the purchase, or (c) for the protection of all creditors at the time of purchase or coming into existence later but before payment by the corporation. The prevailing case law favors the third view, since it appears logical to many courts that credit is extended to the corporation on the belief that the authorized stock originally issued (legal capital) is still outstanding.[54]

Another question which arises is: "What constitutes a creditor?" Regarding this matter the courts have ruled: (a) A person who sells stock to the corporation without receiving consideration at the time of the sale

[52] *Accounting Research Bulletin No. 1* (quoted by permission).
[53] *Unity Gold Corporation*, 1 S.E.C. 25.
[54] Blackstock, 13 *Texas Law Review* 446.

is a creditor, and he has superior rights to subsequent creditors having knowledge of the sale; (b) if a corporation purchases shares of its own stock and issues a note payable at a future date, the stockholder becomes a creditor of the corporation and is entitled to rank equally with other creditors in the event of subsequent insolvency of the corporation, provided that at the time of the purchase the company has sufficient assets to pay its creditors in full and provided the purchase is not made in disregard of the equitable rights of other stockholders.[55]

As noted above, many of the state legislatures have enacted laws restricting the sums which may be legally expended for purchase of treasury shares. These restrictions have been variously expressed, such as

1. Not when it would cause an impairment of capital (Delaware, Michigan, Pennsylvania)
2. Except from surplus
3. Not at a time when the net assets of a corporation are less than its stated or legal capital, or which would reduce its net assets below its legal capital
4. Only out of the surplus of its assets over its liabilities including legal capital
5. Out of its surplus funds available for dividends
6. Not when its net assets are less than the sum of its stated capital, its paid-in surplus, any surplus arising from unrealized appreciation in value or revaluation of its assets, and any surplus arising from surrender to the corporation of any of its shares, or when by so doing its net assets would be reduced below such sum (Illinois)
7. Out of its surplus funds by resolution of its stockholders
8. No corporation may purchase any of its shares when it is insolvent (Connecticut)
9. Upon any purchase of such shares out of earned or paid-in surplus when authorized by this section, earned or paid-in surplus shall be reduced by an amount equal to the purchase price of such shares, but the stated capital will not be affected thereby (California)
10. Except from the surplus of its assets over its liabilities, including capital stock; provided further that shares of capital stock shall be purchased only from earned surplus where there is outstanding another class of shares having a distribution preference over the shares purchased (Georgia)

Some of the preceding limitations are difficult to interpret, and their meanings are not always entirely clear. Examples 2, 4, 6, and 7 are also somewhat misleading. Their meaning is that shares of a corporation's own stock may not be purchased if the result is to reduce the net assets below the amount of legal capital.[56]

In fact, this is the intent of practically all of the statutory limitations. Example 6, however, rather specifically restricts the purchase of treasury shares to earned surplus. Some of the more recent corporation laws eliminate restrictions when purchases are made for certain named purposes,

[55] Blackstock, 13 *Texas Law Review* 447.
[56] (1938) Sanders-Hatfield-Moore 91.

Surplus, plus the establishment of the Reserve for Purchased Treasury Stock at par would effectively safeguard legal capital and the creditors. The Reserve for Purchased Treasury Stock is closed back into Earned Surplus, on the resale of the treasury stock, for amounts equal to the cash received; these debits to the reserve, however, should not exceed the original credit. When all the treasury stock has been sold or canceled, any credit balance remaining in the reserve must be closed into Earned Surplus.

The limitation on the purchase of treasury shares has been well summarized by one writer as follows:

> Corporate surplus accounts (which, as has been shown, are not a part of legal capital) measure the amount of corporate assets that may be used for the payment of dividends or for the purchase of shares of the corporation's stock without impairing the legal capital. Thus . . . the maximum cash that the company may use to purchase its own stock is . . . the balance in the Surplus account. To the extent that all or any part of this . . . cash is used for that purpose, not only is it necessary to debit Treasury Stock and credit Cash with the amount, but it is also necessary to debit Surplus and to credit a properly named surplus reserve account (such as Surplus Reserved for Treasury Stock Purchased) with a like amount. That reserve becomes and remains a part of the legal capital until such time as a like amount comes back to the corporation upon a reissue of the treasury stock. When that happens, the reserve account is debited and Surplus is credited with the amount realized from the reissue.[61]

The solution to the following problem illustrates the recommended treatment of treasury stock where a Reserve for Purchased Treasury Stock is used; it will be noted that the entries for the reserve are entirely independent of the entries for the treasury stock as shares.

*Illustrative Problem*

A corporation has authorized and issued 100 shares, par $100, at 102. It subsequently realized $2,000 income, reacquired 10 treasury shares at 105, sold 5 shares at 108, canceled 1 share, sold 3 shares at 98, and sold 1 share at 104. Give the journal entries under the assumptions that treasury stock is recorded at (a) cost and (b) at par, using the Reserve for Purchased Treasury Stock as recommended in this chapter.

*Solution*

(a) *Recorded at Cost*

| | | |
|---|---|---|
| Cash | $10,200 | |
| Unissued Capital Stock | | $10,000 |
| Paid-in Surplus (From Present Stockholders) | | 200 |
| For sale of 100 shares at 102. | | |
| Cash (or Current Assets) | 2,000 | |
| Earned Surplus | | 2,000 |
| For income realized. | | |

[61] (1947) Inghram 152–153.

| | | |
|---|---|---|
| Treasury Stock | $ 1,050 | |
| Cash | | $ 1,050 |
| For 10 shares reacquired. | | |
| Earned Surplus | 1,050 | |
| Reserve for Purchased Treasury Stock | | 1,050 |
| For appropriation of earned surplus. | | |
| Cash | 540 | |
| Earned Surplus | 15 | |
| Treasury Stock | | 525 |
| Paid-in Surplus (From Present Stockholders) | | 30 |
| For sale of 5 shares at 108. | | |
| Reserve for Purchased Treasury Stock | 540 | |
| Earned Surplus | | 540 |
| To reduce reserve for sale price of treasury shares reissued. | | |
| Unissued Capital Stock | 100 | |
| Paid-in Surplus (From Present Stockholders) | 2 | |
| Earned Surplus | 3 | |
| Treasury Stock | | 105 |
| For cancellation of 1 share. | | |
| Reserve for Purchased Treasury Stock | 100 | |
| Earned Surplus | | 100 |
| To reduce reserve for par of treasury share canceled. | | |
| Cash | 294 | |
| Paid-in Surplus (From Present Stockholders) | 12 | |
| Earned Surplus | 9 | |
| Treasury Stock | | 315 |
| For sale of 3 shares at 98. | | |
| Reserve for Purchased Treasury Stock | 294 | |
| Earned Surplus | | 294 |
| To reduce reserve for sale price of treasury shares reissued. | | |
| Cash | 104 | |
| Earned Surplus | 3 | |
| Treasury Stock | | 105 |
| Paid-in Surplus (From Present Stockholders) | | 2 |
| For sale of 1 share at 104. | | |
| Reserve for Purchased Treasury Stock | 116 | |
| Earned Surplus | | 116 |
| To reduce the reserve to a zero balance since all the treasury shares have been disposed of. | | |

(b) *Recorded at Par*

| | | |
|---|---|---|
| Cash | $10,200 | |
| Unissued Capital Stock | | $10,000 |
| Paid-in Surplus (From Present Stockholders) | | 200 |
| For sale of 100 shares at 102. | | |
| Cash (or Current Assets) | 2,000 | |
| Earned Surplus | | 2,000 |
| For income realized. | | |

| | | |
|---|---|---|
| Treasury Stock | $ 1,000 | |
| Paid-in Surplus (From Present Stockholders) | 20 | |
| Earned Surplus | 30 | |
| Cash | | $ 1,050 |
| For 10 shares reacquired. | | |
| Earned Surplus | 1,000 | |
| Reserve for Purchased Treasury Stock | | 1,000 |
| For appropriation of earned surplus. | | |
| Cash | 540 | |
| Treasury Stock | | 500 |
| Paid-in Surplus (From Present Stockholders) | | 40 |
| For sale of 5 shares at 108. | | |
| Reserve for Purchased Treasury Stock | 540 | |
| Earned Surplus | | 540 |
| To reduce reserve for sale price of treasury shares reissued. | | |
| Unissued Capital Stock | 100 | |
| Treasury Stock | | 100 |
| For cancellation of 1 share. | | |
| Reserve for Purchased Treasury Stock | 100 | |
| Earned Surplus | | 100 |
| To reduce reserve for par of treasury share canceled. | | |
| Cash | 294 | |
| Paid-in Surplus (From Present Stockholders) | 6 | |
| Treasury Stock | | 300 |
| For sale of 3 shares at 98. | | |
| Reserve for Purchased Treasury Stock | 294 | |
| Earned Surplus | | 294 |
| To reduce reserve for sale price of treasury shares reissued. | | |
| Cash | 104 | |
| Paid-in Surplus (From Present Stockholders) | | 4 |
| Treasury Stock | | 100 |
| For sale of 1 share at 104. | | |
| Reserve for Purchased Treasury Stock | 66 | |
| Earned Surplus | | 66 |
| To reduce the reserve to a zero balance since all treasury shares have been disposed of. | | |

**Treasury stock acquired by forfeiture.** Some authorities give the forfeiture of capital stock sold upon the installment plan as a source of treasury stock.[62] The State of Utah, for example, permits a corporation to purchase its own shares (sold at auction for assessments) if no one offers the amount of the assessment and its expense, and this state further requires that this stock be treated as treasury stock.[63] The present writers

[62] (1944) Sunley-Carter 83; (1926) Reiter 238.
[63] *Corporation Laws*, Section 913 (Amended to 1932).

believe that the term "treasury stock," however, should be limited to reacquired shares previously issued as fully paid.[64] If a par value treasury share has not once been fully paid for, it cannot be sold at the best available price without the purchaser becoming liable for the difference between (1) the par value and (2) the sums paid in by the defaulting subscriber and the purchaser of the forfeited share.[65]

In those cases in which the stockholders are not entitled to any excess or are not liable for any deficiency arising from the sale of forfeited stock, the stockholders are completely released from all liability by the forfeiture and vice versa.[66] The power of forfeiture, however, must be exercised in good faith and not for the purpose of discharging stock subscribers from their liabilities.[67] The recommended entries for forfeited stock were given on pages 51 and 53–54.

**Sale of illegally acquired treasury shares.** Treasury shares acquired contrary to state law cannot, of course, be reissued. If shares are sold and there are no unissued shares available with which to make delivery, the sale should be debited to Cash and credited to Suspense — Capital Stock Overissued account until the situation can be legally remedied.[68]

**Treasury stock pledged as collateral.** When par value treasury shares are pledged, Treasury Stock Pledged as Collateral account is debited and Treasury Stock account is credited for the par value of the shares; the Treasury Stock Pledged as Collateral account is credited when the stock is redeemed or when the stock is taken by the creditor; and, in the meantime, the status of the stock should be shown in a footnote to the balance sheet,[69] or the deduction for the treasury stock on the balance sheet should show the pledged and unpledged stock separately.

**Recording transfer of treasury stock.** Stock certificates acquired by the corporation should be assigned to the corporation itself, and then entered in the transfer book and the stockholders' ledger (account headed Treasury Stock or the name of the corporation); the actual issuance of new certificates in the name of the corporation is optional.[70]

**Retirement of capital stock.** *General.* The term "retirement of capital stock" may have reference to (1) a partial retirement of a certain class of stock or (2) to a complete retirement of a certain class where more than one class is outstanding. Both of these instances are to be distinguished from

[64] (1922) Bennett 130; Payne, 16 *Certified Public Accountant* 98; Payne, 10 *Accounting Review* 88; (1946) Finney, I, 137.

[65] 14 *Corpus Juris*, Section 987; *O'Dea v. Hollywood Cemetery Assn.*, 97 Pac. 1; (1933) Kester 447.

[66] 14 *Corpus Juris*, Section 990.

[67] *Mills v. Stewart*, 41 N.Y. 384.

[68] (1931) Sunley-Pinkerton 131.

[69] (1934) Finney, I, 93–94; Forum Section, 14 *American Accountant* 268; (1942) Holmes 140–141.

[70] (1930) Geier-Mautner 196; (1922) Bennett 131; (1936) MacFarland-Ayars 355.

cases involving a quasi-reorganization or a complete liquidation of the corporation. The latter are not treated in this text. As stated previously in this chapter, the accounting problems associated with treasury stock carry over to the subject of capital stock retirement. In fact, practically the same basic questions of (1) contributed versus legal capital, and (2) the "entity equity" theory versus the "issue equity" theory are involved.

Even though these essential features have already been discussed, it is desirable to review them at this point with special emphasis on a matter of considerable current accounting interest — the redemption of preferred stock.

In the illustrative problems on treasury stock given in this chapter, the reader observed that the authors recommend the immediate analysis of the treasury stock elements when it is purchased and first recorded on the books. This technique is followed regardless of whether the stock is to be reissued or retired. In the present section, of course, a retirement is contemplated. In view of the fact, however, that the treasury stock acquisition and retirement may occur simultaneously, the recording process may be shortened by combining the entries previously suggested into one.

*Common stock retirement.* If the common stock which is to be retired has already been previously recorded as treasury stock, the entry to be made is comparatively simple. For example, if 20 shares of $10 par treasury stock is on the books at its legal capital amount of $200, and if this stock is retired, the following entry should be made:

| | | |
|---|---|---|
| Unissued Common Stock . . . . . | $200 | |
| Treasury Stock (Common) . . . . . | | $200 |
| To record retirement of 20 shares of $10 par common stock. | | |

The handling of no-par shares would be similar; that is, the credit to Treasury Stock account is made on the basis of the amount originally recorded therein when the shares were reacquired. It should be emphasized and observed, therefore, that the crux of the problem arises when the shares are first purchased — either for resale or retirement. Since this matter has been treated at length in a previous section, it is not necessary to review it extensively here.

*Preferred stock retirement.* The subject of preferred stock retirement has been exhaustively discussed by accountants in recent years.[71] Many preferred stocks have been completely retired or replaced with issues carrying a lower rate of dividend, and this has caused accountants to analyze carefully the points involved. Again, these points are concerned with (1) the

[71] Scovill, 15 *Accounting Review* 205; Smith, 72 *Journal of Accountancy* 133; May, 72 *Journal of Accountancy* 127; (1944) Sunley-Carter 79–82; (1940) Paton-Littleton 114–117.

handling of the excess of redemption price over the average paid-in contributed capital associated with the shares retired, and (2) the handling of so-called "discounts" resulting from the redemption of preferred stock below the average paid-in contributed capital of the class. As to the latter, it is now generally agreed that the so-called "discount" should be retained as contributed paid-in capital. In regard to point (1) however, a consensus is still lacking. In order to present the issue in a clear-cut fashion the following opinion of the Chief Accountant of the Securities and Exchange Commission is quoted in full:

Inquiry has frequently been made as to whether a premium paid on the redemption of preferred stock in excess of the amounts paid in thereon may properly be charged against capital contributed by another class of shareholders or whether, when earned surplus is present, the excess premium should be charged thereagainst. The following case is typical. The A Corporation has outstanding 10,000 shares of $100 par value 6 per cent cumulative preferred stock which was sold at 105 and is redeemable at the option of the company on any dividend date at 110. There are also outstanding 40,000 shares of $50 par value common stock which were sold at $60 per share. At the time the corporation proposes to call the preferred shares for redemption, the balance sheet reflects earned surplus of $300,000 and capital surplus of $450,000. The capital surplus consists of $50,000 paid in by preferred shareholders and $400,000 paid in by common shareholders.

The case presented involves a fundamental principle of accounting, maintenance of the distinction between capital and income. In recognition of this principle, it has long been agreed that paid-in capital may not be used to absorb expenses or charges that should be deducted from gross income or revenue to determine net income.[72]

While the charge involved in the instant case is not relevant to a determination of the amount of net income, it does raise the cognate question of whether payment of redemption premiums in excess of the amount paid in on the shares being retired should first be considered to be distributions of available earned surplus, rather than of amounts paid in on shares still outstanding.

In order to maintain a proper distinction between capital and income, it is my [William W. Werntz] opinion that it is necessary to consider the entire amount contributed by shareholders as capital regardless of whether reflected in the accounts as capital stock or as capital or paid-in surplus. When a corporation by appropriate legal action classifies its share capital, with resulting distinctions in dividend rights, asset priorities, voting powers, and other matters, adherence to the principles mentioned, in my opinion, requires appropriate accounting recognition of the classification of shares not only in respect of the legal or stated capital but also in respect of the related contributions in excess of legal or stated capital. In my opinion, reflection of a redemption premium paid to one class of shareholders as a diminution or utilization of amounts contributed by another class, or by shares of the same class still outstanding, would ordinarily be inconsistent with recognition of these principles in that the capital contribution shown for outstanding shares would thenceforth be less than the amount actually paid in on such shares although

[72] In the course of a formal reorganization, or a quasi-reorganization, a deficit in earned surplus may be charged to capital surplus. See *Accounting Series Releases Nos. 1, 15, 16,* and *25.* [Footnote in original release.]

(1) no amounts were in fact repaid in respect of the outstanding shares; (2) at the time of the disbursement there existed accumulated earned surplus; and (3) such earned surplus would therefore be available for distribution as apparently earned dividends, although in fact capital contributed in respect of the outstanding shares had not been maintained intact.

It is, therefore, my opinion that in the case cited the amount paid preferred shareholders in excess of the amounts contributed by them should be charged to earned surplus. Also, if at the time of redemption any amounts are paid on account of accumulated unpaid dividends, such amounts should likewise be charged to earned surplus.

In the above example an entire issue of preferred shares was assumed to have been redeemed. If less than an entire issue were redeemed it would not, in my opinion, ordinarily be proper, in the light of the above discussion, to charge against capital surplus contributed by the preferred stock an amount per share in excess of the prorata portion of such capital surplus applicable to each share of preferred stock outstanding prior to the redemption in question.

In the case cited, all of the capital surplus represented amounts paid in on shares still outstanding. In some cases a part of capital surplus may have resulted from the prior reacquisition and retirement of preferred or common shares at less than the amounts paid in thereon.[73] Such capital surplus does not therefore represent any amounts paid in on shares still outstanding. Where this condition exists, I would ordinarily see no objection to utilizing such capital surplus for the purpose of absorbing the excess of the redemption price over the amounts paid in on the shares being retired.

There remain to be considered cases in which outstanding preferred stock is retired and replaced by new preferred stock, usually bearing a lower dividend rate. In such case, of course, a saving to junior security holders is accomplished which will be reflected in increased earnings applicable to junior securities, and unless distributed, in increased balances of earned surplus. In a number of such cases arising under the Public Utility Holding Company Act of 1935, where earned surplus was absent or inadequate, the Commission has as a matter of administrative policy raised no objection to a procedure designed to offset the redemption premiums against subsequent earnings. However, in such cases it has ordinarily been required that the annual offset be not less than the savings effected by the lower dividend rate on the new stock and that in any case the premiums be fully offset within a reasonably short period.[74]

The above recommendations may be followed if the three accounts previously recommended are used for paid-in surplus: Paid-in Surplus (From Present Preferred Stockholders), Paid-in Surplus (From Present Common Stockholders), and Paid-in Surplus (Miscellaneous). The use of these accounts is shown in the journalization of the following transactions which involve the same corporation in order listed; treasury stock is recorded at par value at date of acquisition.

[73] When capital stock is reacquired and retired, it is recognized that any surplus arising therefrom is capital and should be accounted for as such. See *Accounting Series Release No. 6* (1938); American Institute of Accountants, *Accounting Research Bulletin No. 1* (1939). [Footnote in original release.]

[74] *Accounting Series Release No. 45.*

1. A corporation issued 10,000 shares of $100 par value convertible preferred stock at 105 and 40,000 shares of $50 par value common stock at 60.

| | | |
|---|---|---|
| Cash | $3,450,000 | |
| Preferred Capital Stock | | $1,000,000 |
| Paid-in Surplus (From Present Preferred Stockholders) | | 50,000 |
| Common Capital Stock | | 2,000,000 |
| Paid-in Surplus (From Present Common Stockholders) | | 400,000 |

2. The corporation made operating profits of $300,000.

| | | |
|---|---|---|
| Cash (and other assets) | $300,000 | |
| Earned Surplus | | $300,000 |

3. The corporation purchased 1,000 common shares at 54.

| | | |
|---|---|---|
| Treasury Common Stock | $50,000 | |
| Paid-in Surplus (From Present Common Stockholders) | 10,000*a* | |
| Cash | | $54,000 |
| Paid-in Surplus (Miscellaneous) | | 6,000*b* |

*a*. 1,000 times $10 premium per share on original issue.
*b*. Amount necessary to balance entry.

4. The corporation purchased 2,000 preferred shares at 112.

| | | |
|---|---|---|
| Treasury Preferred Stock | $200,000 | |
| Paid-in Surplus (From Present Preferred Stockholders) | 10,000*c* | |
| Paid-in Surplus (Miscellaneous) | 6,000*d* | |
| Earned Surplus | 8,000*e* | |
| Cash | | $224,000 |

*c*. 2,000 times $5 premium per share on original entry.
*d*. Amount necessary to balance this account.
*e*. Amount necessary to balance entry.

5. The corporation sold 80 per cent of its treasury common stock at 56 and 60 per cent of its treasury preferred stock at 115.

| | | |
|---|---|---|
| Cash | $182,800 | |
| Treasury Common Stock | | $40,000 |
| Paid-in Surplus (From Present Common Stockholders) | | 4,800*f* |
| Treasury Preferred Stock | | 120,000 |
| Paid-in Surplus (From Present Preferred Stockholders) | | 18,000*g* |

*f*. 800 times $6 premium per share.
*g*. 1,200 times $15 premium per share.

6. The corporation sold the remaining treasury preferred shares at 99 and the remaining treasury common shares at 48.

| | | |
|---|---|---|
| Cash | $88,800 | |
| Paid-in Surplus (From Present Preferred Stockholders) | 800*h* | |
| Paid-in Surplus (From Present Common Stockholders) | 400*i* | |
| Treasury Preferred Stock | | $80,000 |
| Treasury Common Stock | | 10,000 |

*h*. 800 times $1 discount per share.
*i*. 200 times $2 discount per share.

7. A stockholder gave the corporation 100 shares of common stock, which were sold at 51.

| | | |
|---|---|---|
| Treasury Common Stock | $5,000 | |
| Paid-in Surplus (From Present Common Stockholders) | 986*j* | |
| Paid-in Surplus (Miscellaneous) | | $5,986 |
| Cash | 5,100 | |
| Treasury Common Stock | | 5,000 |
| Paid-in Surplus (From Present Common Stockholders) | | 100*k* |

*j*. 100 times prorata amount of Paid-in Surplus (From Present Common Stockholders) per share.
*k*. 100 times $1 premium per share.

8. The corporation suffered an operating loss of $991,500, reduced the common stock par value to $40 a share, and wrote off the earned surplus deficit against paid-in surplus.

| | | |
|---|---|---|
| Earned Surplus | $991,500 | |
| Cash (and other assets) | | $991,500 |
| Common Capital Stock | 400,000 | |
| Paid-in Surplus (From Present Common Stockholders) | | 400,000 |
| Paid-in Surplus (Miscellaneous) | 5,986*l* | |
| Paid-in Surplus (From Present Common Stockholders) | 693,514*m* | |
| Earned Surplus | | 699,500 |

*l*. Amount necessary to balance account.
*m*. Amount necessary to balance entry.

9. The corporation purchased 200 common shares at 41, and sold them at 45.

| | | |
|---|---|---|
| Treasury Common Stock | $8,000 | |
| Paid-in Surplus (From Present Common Stockholders) | 500*n* | |
| Cash | | $8,200 |
| Paid-in Surplus (Miscellaneous) | | 300*o* |
| Cash | 9,000 | |
| Treasury Common Stock | | 8,000 |
| Paid-in Surplus (From Present Common Stockholders) | | 1,000*p* |

*n*. 200 times $2.50 [i.e., balance of Paid-in Surplus (From Present Common Stockholders) per share].
*o*. Amount necessary to balance entry.
*p*. 200 times $5 premium per share.

10. The corporation converted 1,000 shares of preferred stock into 2,000 shares of common stock.

| | | |
|---|---|---|
| Preferred Capital Stock | $100,000 | |
| Paid-in Surplus (From Present Preferred Stockholders) | 5,720*q* | |
| Common Capital Stock | | $80,000 |
| Paid-in Surplus (From Present Common Stockholders) | | 25,720*r* |

*q*. 1,000 times $5.72 [i.e., balance of Paid-in Surplus (From Present Preferred Stockholders) per share].
*r*. Amount necessary to balance entry.

11. The president donated 1,000 common shares, which were sold at 41.

| | | |
|---|---|---|
| Common Par Value Treasury Stock (1000 shares) | $40,000 | |
| Paid-in Surplus (From Present Common Stockholders) | 3,005 | |
| Paid-in Surplus (Miscellaneous) | | $43,005 |
| Cash | 41,000 | |
| Paid-in Surplus (From Present Common Stockholders) | | 1,000 |
| Common Par Value Treasury Stock (1,000 shares) | | 40,000 |

*Work Sheet*

Paid-in Surplus
(From Present Preferred Stockholders)

| Entry | Shares | Per Share | Total |
|---|---|---|---|
| (1) | 10,000 | $5.00 | $50,000 |
| (4) | 2,000 | 5.00 | 10,000 |
| | 8,000 | 5.00 | $40,000 |
| (5) | 1,200 | | 18,000 |
| | 9,200 | | $58,000 |
| (6) | 800 | | 800 |
| | 10,000 | 5.72 | $57,200 |
| (10) | 1,000 | 5.72 | 5,720 |
| | 9,000 | | $51,480 |

Paid-in Surplus (Miscellaneous)

| Entry | Dr.*; Cr. |
|---|---|
| (3) | $6,000 |
| (4) | 6,000 * |
| (7) | 5,986 |
| (8) | 5,986 * |
| (9) | 300 |
| (11) | 43,005 |
| Balance | $43,305 |

Paid-in Surplus
(From Present Common Stockholders)

| Entry | Shares | Per Share | Total |
|---|---|---|---|
| (1) | 40,000 | $10.00 | $400,000 |
| (3) | 1,000 | 10.00 | 10,000 |
| | 39,000 | 10.00 | $390,000 |
| (5) | 800 | | 4,800 |
| | 39,800 | | $394,800 |
| (6) | 200 | | 400 |
| | 40,000 | 9.86 | $394,400 |
| (7) | 100 | 9.86 | 986 |
| | 39,900 | | $393,414 |
| (7) | 100 | | 100 |
| | 40,000 | | $393,514 |
| (8) | ..... | | 400,000 |
| | 40,000 | | $793,514 |
| (8) | ..... | | 693,514 |
| | 40,000 | 2.50 | $100,000 |
| (9) | 200 | 2.50 | 500 |
| | 39,800 | | $ 99,500 |
| (9) | 200 | | 1,000 |
| (10) | 2,000 | | 25,720 |
| | 42,000 | 3.005 | $126,220 |
| (11) | 1,000 | 3.005 | 3,005 |
| | 41,000 | | $123,215 |
| (11) | 1,000 | | 1,000 |
| | 42,000 | | $124,215 |

Up to this time there has been no public statement by the Accounting Procedure Committee of the American Institute of Accountants expressing itself either one way or the other concerning the entire matter at issue, but several accountants have stated that they do not agree with conclusions reached in the release quoted on pages 101–102. One authority has pointed out, for example, that the procedure might unreasonably restrict the declaring of dividends on the common stock.[75] Another authority (George O. May) insists that "such a rule might prevent the consummation of transactions that ought to be permitted or encouraged. It might confer a minor benefit to preferred stockholders not contemplated by the law or their contract, but this purpose does not justify requirement of a charge to earned surplus." [76] The latter authority goes on to recommend that the premium on preferred stock retired (but replaced with another issue) be charged against (a) any premium previously received on the identical issue (which is still on the books), and (b) any premium on the

[75] Broad, 17 *Accounting Review* 35-41.
[76] (1945) Leland, Ch. 9, p. 11.

sale of the new issue (especially if the manner of application of the premium has been indicated to the subscriber of the new issue). If the total of (a) and (b) is not sufficient, he states that "a charge against any other paid-in surplus could be justified. However, it will usually be preferable to make the charge instead against earned surplus." [77]

Still another authority points out that the application of the technique suggested in the release may become quite involved and perhaps arbitrary if several capital readjustments have been experienced by the company retiring the stock.[78] In addition, according to this authority, these readjustments might be so numerous as to negate the possibility of analyzing the facts sufficiently to obtain the paid-in surplus applicable to the several classes of shares.

The preceding arguments, while aptly expressed, do not appear to the present writers sufficiently cogent to warrant a departure from the views expressed at length earlier in this chapter, namely, that the payment of a redemption premium to preferred stockholders (over and above the prorata amount of their contributed capital) constitutes a special "distribution" to the payees, and as such (from a going concern viewpoint) constitutes an appropriate charge to Earned Surplus — the traditional buffer section of the corporate equity.[79]

*Capital stock retirement — taxability.* The redemption of stock by a corporation may under certain circumstances result in taxable income to the stockholder. Section 115 (g) of the Internal Revenue Code (1938) provides that "if a corporation cancels or redeems its stock (whether or not such stock was issued as a stock dividend) at such time and in such manner as to make the distribution and cancellation or redemption in whole or in part essentially equivalent to the distribution of a taxable dividend, the amount so distributed in redemption or cancellation of the stock to the extent that it represents a distribution of the earnings or profits accumulated after February 28, 1913, shall be treated as a taxable dividend." The question, therefore, is one of fact, and many cases have been brought to the courts regarding the issue. A full discussion of the many tests which have been adopted is beyond the scope of this text.[80]

[77] *Ibid.*
[78] (1944) Sunley-Carter 82.
[79] (1943) Paton 1013.
[80] For a comprehensive treatment see Gutkin-Beck, 80 *Journal of Accountancy* 285.

# CHAPTER 4

## Surplus and Surplus Reserves

**Nature of surplus.** The term "surplus," like "capital," has many different meanings in corporation accounting. In fact, these meanings are now so numerous and diverse that the word "surplus" should never be used without a qualifying adjective or a descriptive explanatory phrase. In earlier years the matter was not of prime importance. This is evidenced by the fact that both the courts and the average accountant referred to surplus as an "excess of assets" over some standard which the declarer had in mind at the moment. As corporate accounting developed over the years, however, it became obvious that the excess of assets could arise from varied sources. Because of these various possible sources the practice of classifying surplus gradually evolved. The exact classification scheme to be employed is still in a discussion state, however, even though considerable thought has been given to the standards to be adopted.

As explained in detail in Chapter 2, corporate surplus in a broad sense (and at any given time) is a part of the proprietary equity or business capital. It is only in this sense that "surplus is capital." The problem of distinguishing between capital and surplus becomes acute when an attempt is made to subdivide the business capital, and it is in this sphere of accounting that the authorities are in partial conflict. Decisions have to be made, for example, as to (1) whether stated or legal capital is more significant or controlling than contributed capital; (2) whether surplus arising from transactions with non-owners is different from surplus contributed by owners; and (3) whether surplus from reappraisals is reportable as a distinct classification. There is now some agreement on these matters even though it is far from being unanimous.

Some laymen have the impression [1] that the various types of corporate surplus represent funds and that they may be identified with specific assets. These notions have a certain degree of reasonableness underlying them but are generally erroneous.[2] Surplus to the accountant is more of a mathematical measure than it is the assets themselves; it is the balancing item on the corporate balance sheet. Only in the event that all the assets were of one type, say cash in bank, could one properly identify the various classes of surplus with specific types of assets. This case obviously does

[1] A somewhat unusual example of this was cited in the March, 1946, *Reader's Digest:* "FBI agents trapped three men who had unsuccessfully attempted to extort $40,000 from a Harvard, Ill., banker. Asked why they chose the sum of $40,000, the men explained: 'why it was right there on a big sign in front of the bank. It said, 'Surplus, $40,000.'"

[2] (1943) Hatfield 8.

not arise often. In most instances the surplus accounts represent, therefore, the accountant's distinction as to contributed surplus, accumulated surplus, and revaluation surplus.

**Classes of surplus.** *General.* As the various possible classifications of surplus overlap, the accountant cannot ordinarily show all the classifications on a balance sheet. In view of this, it is the opinion of the present writers that the accountant's primary duty is to segregate the accumulated surplus from the contributed surplus; his secondary duty is to disclose fully the facts so that the reader of the balance sheet may, if he desires, classify the surplus items for other purposes, such as legal and taxation matters.

*Segregated as to source.* Corporate surplus may be classified as to source as follows:

1. From outsiders (non-owners):
   a. Ordinary transactions
   b. Unusual transactions
   c. Gifts from outsiders and remission of debts
2. From insiders (owners):
   a. Subscription payments in excess of par value or stated value of stock
   b. Transactions involving treasury stock
   c. Reduction in par or stated value of stock
   d. Gifts from stockholders
   e. Assessments of stockholders
   f. Forfeiture of stock subscriptions
3. From revaluation of assets

The above classification agrees quite closely with the segregations of surplus frequently used on balance sheets. Class No. 2 includes the items that are often placed in the Paid-in Surplus account and Class No. 3 includes the appreciation normally recorded in the Revaluation Surplus account. Class No. 1 combines three rather dissimilar items. Formerly it was thought that unusual gains should be recorded in a special Surplus account.[3] The trend, at present, is to carry all realized gains and profits obtained from outsiders into the Profit and Loss account and from there into Earned Surplus. Gifts from outsiders and remissions of debts are not earnings (at least at the time they are received), and as they occur infrequently, each item should be given a name indicating definitely its source.[4] Utilities are sometimes required to credit the forgiveness of a debt to the Capital Surplus account;[5] while this procedure satisfactorily

[3] Finney, H. A., *Principles of Accounting*, Volume 1 (New York: Prentice-Hall, Inc., 1923), Ch. 7, pp. 14–15.

[4] (1924) Couchman 194.

[5] Federal Power Commission, *Uniform System of Accounts Prescribed for Utilities, Subject to the Provisions of the Federal Power Act* (Washington: Government Printing Office, 1937), p. 36.

keeps these donations out of the Earned Surplus account, the use of a Capital Surplus account in the ledger is now considered unfortunate. "Capital Surplus," a generic term applying to all forms of surplus except earned, should not be used for balance sheet purposes (see full discussion in later section of this chapter).

*Segregated as to realization.* Surplus may be divided into realized and unrealized sums. The subject of realization is treated at length in Chapter 12, but it may be noted here that values coming into the corporation from both insiders (owners) and outsiders can give rise to realized surplus. While occasionally unconditional gifts from outsiders are treated as unrealized surplus,[6] it is the opinion of the present authors that such items constitute realized surplus to the extent of the fair market value of the property donated.[7] The gross profit on installment sales can be handled as either realized or unrealized.[8] When it is treated as unrealized, it is recorded in a special proprietary equity account called Unrealized Gross Profit on Installment Sales.

The term "unrealized surplus" should be limited to the unamortized surplus arising from formal appraisals of property. While appreciation formerly was carried in the Capital Surplus account along with contributed surplus, the need of differentiating between realized and unrealized surplus has caused a partial abandonment of the Capital Surplus account. The realized elements that formerly were recorded in the Capital Surplus account are now usually credited to the Paid-in Surplus account, while the unrealized capital surplus items are generally placed in a special account, entitled either Revaluation Surplus account or Reserve for Unrealized Appreciation account.

*Classed as to availability for dividends.* The classification basis is affected by the intention of the directors, applicable legal restrictions, and by whether the surplus is realized. For instance, surplus is generally not available for cash dividends if:

1. The directors appropriate it to other purposes
2. The surplus is a part of the corporate legal capital, or there are special legal restrictions placed upon its distribution as dividends
3. The surplus is unrealized

While arguments have from time to time appeared favoring an attempt on the part of the accountant to classify surplus on the basis of its availability for dividends, most authorities are opposed to the suggestion, since it might connote to the reader of the statement nonexistent intentions

[6] Thompson, 7 *Accounting Review* 160; Thompson, 60 *Journal of Accountancy* 40.
[7] (1936) Marple 136.
[8] (1949) Karrenbrock-Simons, I, 86.

of the board of directors.[9] The entire subject of the availability of the various types of surplus for dividends is discussed in Chapter 6.

*Appropriated and unappropriated surplus.* The terms "appropriated surplus" and "unappropriated surplus" are not used as account titles but may be used as subcaptions in the statement of earned surplus or the balance sheet. Surplus should be assumed to be unappropriated in the absence of information to the contrary. Appropriated earned surplus may be divided into two classes: (1) Reservations obligatory on the corporation, such as a reserve for sinking fund when the bond contract calls for the establishment of such a reserve; and (2) reservations optional with the board of directors, such as a reserve for betterments or a reserve for contingencies. These reserves are debited to Earned Surplus and are returned to Earned Surplus when no longer needed. The accounting for contingency and other earned surplus reserves is discussed later in this chapter.

**Earned surplus or retained income.** *Definition.* The American Institute of Accountants' Special Committee on Terminology has defined earned surplus as "the balance of the net profits, net income, and gains of a corporation after deducting losses and after deducting distributions to stockholders and transfers to capital stock accounts." [10] This definition uses the classification of surplus based upon the source of the item, and limits earned surplus to profits, incomes, and gains arising from both ordinary and unusual transactions with outsiders. It should be noted, however, that gifts from outsiders are not specifically mentioned as being a source of earned surplus.

Another significant definition has been furnished by the Executive Committee of the American Accounting Association:

> Retained income is the amount of income since the formation or reorganization of the enterprise less the amount distributed to stockholders. Distributions include dividends and the excess of the amount of assets disbursed in the reacquisition of shares of capital stock over the prorata portion of paid-in capital applicable to such shares. The distinction between paid-in capital and retained income should be permanent. Where retained income has been designated as paid-in capital by means of stock dividends, recapitalizations, or by other customary corporate action the amount so designated should be indicated in the balance sheet. . . . A change in paid-in capital and retained income such as one resulting from the issuance, acquisition, conversion or exchange of capital stock, and from stock dividends, should be disclosed in the financial statements of the period in which the change occurs. Distributions to stockholders and preferences attaching to the ownership of particular classes of shares or capital stock should also be disclosed.[11]

[9] (1943) Paton 1028.

[10] Quoted in 6 *Accounting Review* 212.

[11] 23 *Accounting Review* 342–343, 344 (quoted by permission). Note that this Committee recommends the adoption of the expression "retained income."

During the past decade, a great deal of attention has been given to the subject of earned surplus, especially in regard to the following matters: (1) The general desirability of the term; (2) the question of direct charges and credits; (3) income taxes; (4) "frozen" earned surplus; and (5) "dated" earned surplus resulting from quasi-reorganizations.

*Desirability of the term.* Accounting authorities have from time to time commented on the possible ambiguity of the term "earned surplus," especially in the mind of the lay reader of the balance sheet.[12] Undoubtedly, there are some misconceptions as to the nature of this element of corporate proprietary equity. As noted previously some persons confuse it with a fund, as well as giving it a connotation of value. Both of these impressions are "either nondescriptive or misdescriptive." [13] As a result of their study of the subject, the Subcommittee on Terminology of the American Institute of Accountants recommended in 1949 the abandonment of the term and the substitution therefor of some other expression.[14] Up to the present time the recommendation has not been widely adopted, the opinion of many accountants being that it is the concept rather than the terminology that is at fault.[15] It is also likely that any substitute term would soon be subjected to criticism. As one authority has expressed the matter: "If, in the criticism and recasting of old concepts, accountants would include the redefinition of old terms and forget the fancied need for new ones, the cause of good accounting practice would be more quickly advanced." [16]

In order to show the type and variety of expressions which have been used by business firms, the results of one study [17] are given on page 112.

*Direct charges and credits.* During the past few years the tendency in accounting has been to keep the number of direct charges and credits to Earned Surplus as few as possible. Formerly, many accountants customarily cleared unusual gains and losses directly to Earned Surplus, as well as dividends and the net operating profit for the fiscal period. In more recent times, however, the question of the handling of the unusual items has received a great deal of attention, especially in relation to the reporting of periodic income. For this reason, a full discussion of the problem presented is postponed to Chapters 13 and 14. It is sufficient at this point merely to indicate that the subject has many ramifications and that no definite solution has thus far been advanced.

[12] See *Accounting Research Bulletin No. 9.*

[13] *Accounting Research Bulletin No. 12.*

[14] 88 *Journal of Accountancy* 481. The Executive Committee of the American Accounting Association has recommended the use of the expression "retained income."

[15] (1943) Paton 1024; (1945) Leland, Ch. 4, p. 12.

[16] (1945) Leland, Ch. 4, p. 12.

[17] Quoted by permission from *Accounting Techniques Used in Published Corporate Reports, 1949*, American Institute of Accountants, pp. 77–78. While not included in the statistics, a few companies used the term "earned surplus" but added a new description parenthetically thereafter (e.g., Standard Oil Company of Kentucky).

| 1948 | 1947 | 1946 | |
|---|---|---|---|
| 329 | 361 | .. | Earned surplus |
| 63 | 73 | .. | Earned surplus from a specific date |
| 11 | 8 | .. | Earned surplus — appropriated and unappropriated |
| 21 | 20 | .. | Surplus |
| 1 | 1 | .. | Surplus — undivided profits |
| 1 | 1 | .. | Further surplus |
| 3 | 3 | .. | Operating surplus or surplus from operations |
| 4 | 5 | .. | Earned surplus (deficit) |
| 1 | 1 | .. | Deficit |
| 19 | 9 | 1 | (Net) earnings *retained* (for use) in the business |
| 10 | 7 | 4 | (Net) income *retained* (for use) in the business |
| 4 | 3 | .. | Earnings *retained* and invested in the business |
| 3 | 1 | .. | Accumulated earnings *retained* (for use) in the business |
| 3 | 1 | .. | Earnings *retained* and used (in use) in the business |
| 3 | 1 | .. | Income *retained* and invested in the business |
| 2 | 1 | .. | Profits *retained* in the business |
| 2 | 1 | .. | Earnings *retained* and employed in the business |
| 1 | 1 | .. | Profits *retained* in the business less amounts transferred to Capital Stock account |
| 1 | 1 | .. | Other capital and income *retained* in the business |
| 1 | 1 | 1 | Earnings accumulated since inception, *retained* and invested for the conduct of the business |
| .. | 1 | 1 | Income accumulated and *retained* in the enterprise |
| 3 | 1 | 2 | Earnings *reinvested* in the business |
| 3 | 1 | 1 | Earnings *reinvested* |
| 2 | 2 | 2 | Income *reinvested* in the business |
| 1 | 1 | 1 | Earnings *reinvested* and employed |
| 4 | 1 | .. | Earnings *reinvested* or retained in the business |
| 3 | 2 | 1 | Income *invested* in the business |
| 1 | 1 | .. | Earnings *invested* in plant facilities and working capital |
| 1 | .. | .. | Accumulated earnings *invested* in the business |
| 2 | 1 | .. | Earnings *invested* (for use) in the business |
| 7 | 6 | 1 | Accumulated earnings |
| 6 | 3 | .. | Earnings *employed* in the business |
| 2 | .. | .. | Accumulated earnings *employed* in the business |
| 1 | 1 | 1 | Net income *employed* in the business |
| 1 | 2 | 1 | Profit *employed* in the business |
| 2 | 1 | .. | Earnings *used* in the business |
| 2 | .. | .. | Undistributed earnings *in use* in the business |
| 1 | 1 | .. | Undivided profits |
| 525 | 525 | | |

*Income taxes.* Taxes on income have been handled several different ways in past years. Some accountants view the charge as a direct debit to Earned Surplus, while others carry the charge into the Profit and Loss account. Regardless of how the charge may be treated in the ledger, most accountants show the income taxes on the statement of profit and loss as a deduction in determining the income available for stockholders. If the

charge is made to Earned Surplus, the theory is adopted that the income taxes are simply the government's share of the profit, similar in nature to a dividend. The Committee on Accounting Procedure of the American Institute of Accountants made a thorough study of the matter, and issued the following recommendations: [18]

1. Income taxes are an expense which should be allocated, when necessary and practicable, to income and other accounts, as other expenses are allocated.

2. Where an item resulting in a material increase in income taxes is credited to surplus, the portion of the current provision for income taxes which is attributable to such item should be applied in reduction of the credit to surplus and taken up as a credit in the income statement, specifically disclosed and appropriately described, either as a deduction from the aggregate current provision for income taxes or as a separate credit.

3. Where an item resulting in a material reduction in income taxes is charged to surplus, the amount of the reduction should be applied against the charge to surplus and included as a charge in the income statement, specifically disclosed and appropriately described, either as an increase in the provision for income tax allocated to income included in the income statement, or as a portion of the item in question equal to the tax reduction resulting therefrom.

4. Where an item resulting in a material reduction in income taxes is charged to or carried forward in a deferred-charge account, or charged to a reserve account, it is desirable to include a charge in the income statement of an amount equal to the tax reduction in the manner set forth in paragraph 3 hereof. If it is impracticable to apply such procedures the pertinent facts should be clearly disclosed.

5. Additional income taxes for prior years, or additional provisions therefor, should be included in the current income statement and, if material, should be shown separately. Refunds of such taxes, and provisions therefor no longer required, should be similarly treated as credits.[19]

6. Amounts of income taxes paid in prior years, which are refundable to the taxpayer as a result of the "carry-back" of losses or unused excess-profits credits, should be included in the income statement of the year in which the loss occurs or the unused excess-profits credit arises, provided that, if the amount is material, the net income resulting from the operations of the year should be shown without the inclusion thereof, and the amount should thereafter follow in the income statement as a separate item.[19]

7. Where material amounts of losses or unused excess-profits credits of prior years are carried forward into the current tax return, the operating results for the current year should preferably be shown without inclusion of the tax reduction resulting therefrom, i.e., the current provision for income taxes should be computed and shown in the income statement without the benefit of such "carry-forward," and the amount of the tax reduction should be shown in the income statement as a separate item.[19]

8. The provision for income taxes, or the portion thereof allocated to current income, may be included at the end of the income statement, immediately preceding

[18] *Accounting Research Bulletin No. 23* (quoted by permission).

[19] In connection with paragraphs 5, 6, and 7 hereof, the charges and credits may be made directly to surplus if misleading inferences might be drawn from their inclusion in the income statement. [Footnote in original bulletin.]

the showing of net income for the period, or it may be appropriately classified as an operating expense.

9. Provisions for income taxes for the current and prior years should generally be classified in the balance-sheet as current liabilities. Claims for refund under the "carry-back" provisions of the Internal Revenue Code may be shown as current assets if collection is reasonably assured.

10. Where credits are made to surplus, directly or through the income statement, of significant amounts as to which, because of differences in accounting methods, no income tax has been paid or provided for, disclosure should be made. If a tax is likely to be paid thereon, provision should be made therefor on the basis of an estimate of the amount thereof.

. . . . . .

Where an item resulting in a material reduction in income taxes is charged to surplus, the principle of allocation may be applied in the income statement in either one of two ways: (a) the current provision for income taxes may be shown as if the item in question were not deductible (the total amount of tax estimated to be legally due for the year being indicated) or (b) a charge may be included for a portion of such item equal in amount to the tax reduction resulting therefrom. In either case the amount charged to surplus would be reduced accordingly.

The recommendations expressed above have been considered at length by the Securities and Exchange Commission.[20] The conclusions of the Commission were substantially in accord with the opinions expressed, with the exception of alternative (a) in the last paragraph quoted above. In regard to this treatment of a charge in lieu of taxes the Commission has indicated that it would probably not be acceptable for registration statements.[21] The attitude of the Commission is that the (a) alternative does not purport to allocate income taxes in relation to the actual results of operations, and may hardly "be termed an allocation at all, as the term is customarily used." [22]

In order to show the practices followed by several firms, the Research Department of the American Institute of Accountants [23] gathered the data below:

The following schedule attempts to describe variations in the methods of tax allocation noted in 1947 reports. It is followed by examples of explanations given in cases where no tax allocation was made.

The recommendations in *Accounting Research Bulletin No. 23*, "Accounting for Income Taxes" (December 1944), with respect to the treatment of tax allocations, specified that charges or credits in the income statement as the result of such allocations should be "specifically disclosed and appropriately described." In a great many of the 1947 reports, the only indication that a tax allocation affected the income account was found in the description accompanying a charge or credit to the Surplus account.

[20] *Accounting Series Release No. 53.*
[21] Editorial, 81 *Journal of Accountancy* 1.
[22] Editorial, 81 *Journal of Accountancy* 2.
[23] *Accounting Trends in Corporate Reports, 1949*, pp. 65–66.

**Charges to Reserve, Net of Tax Effect**

5 Item charged in the income statement and a portion of the reserve, equal in amount to the excess of such item over the related tax reduction, transferred to the income statement as a credit (Motor Wheel Corporation)

4 Provision for income taxes shown as if charge were not deductible for tax purposes, the total amount of tax estimated to be legally due for the year or the tax effect of the special charge being indicated in a footnote (Marshall Field & Company)

2 Amount equal to tax reduction charged separately in the income statement (McCall Corp.)

1 President's letter contained only reference to reduction in income taxes occasioned by charge to reserve, tax provision being shown as if charge were not deductible for tax purposes (American Stores Co.)

the tax payable on profits from sales of securities has been charged to the general reserve since such profits are credited to this reserve." (Footnote — General Electric Co.)

**Charges to Surplus, Net of Tax Effect**

10 Provision for income taxes shown as if charges were not deductible for tax purposes but amount of tax legally due not indicated either in the income statements or in footnotes (Air Reduction Co. Inc.)

4 Separate charge included in the income statement equal to the tax reduction (Rexall Drugs Inc.)

2 Provision for taxes shown in income statement as if charge were not deductible for tax purposes, but total amount of tax estimated to be legally due for the year indicated in footnote (The May Department Stores Company)

**Credits to Surplus, Net of Tax Effect**

5 Provision for taxes shown in income statement as if surplus credit were not taxable, and amount of tax legally due not indicated either in the income statement or in footnotes (In two of these cases, however, the specific amount of the tax offset was stated in describing the surplus credit.) (Continental Steel Corporation)

3 Provision for taxes shown in income statement as if surplus credit were not taxable, but total amount of tax estimated to be legally due for the year indicated in footnote (West Virginia Pulp & Paper Co.)

**Other Allocations**

10 Extraordinary or non-operating costs or profits net of related tax effect shown in the income statement before "net income," usually following the provision for federal income taxes, the latter being shown as if the extraordinary item were not deductible for tax purposes (Libby, McNeill & Libby and Schenley Distillers Corp.)

1 Provision for possible future inventory price declines charged to cost of sales net of applicable tax effects (Stewart-Warner Corp.)
1 Provision for past service pension costs less related tax effect shown before net income, with amount equal to tax effect thereof shown separately and added to the provision for federal taxes on income (Endicott Johnson Corp.)
1 Adjustment of depreciation reserves, less resultant adjustment of taxes and renegotiation shown as charge in income statement prior to net income (Hayes Manufacturing Co.)
1 Reduction in current income taxes, resulting from payments for past service annuities previously charged to surplus reserves, treated as a general expense in the income statement and added to surplus (S. S. Kresge Co.)
2 Portion of reserve, created in prior year in amount equal to estimated additional taxes payable as a result of the future non-deductibility for tax purposes of depreciation on fully amortized emergency facilities, transferred to the income statement (The W. L. Maxson Corporation)

*"Frozen" earned surplus.* The board of directors, with the subsequent approval of the stockholders, may transfer earned surplus to the Capital Stock account as stock dividends or to the No-par Preferred Capital Stock account to bring that stock up to its liquidation value. Such procedure "freezes" the earned surplus, and the transfers cannot later be reversed. For instance, if, after the stock dividend, the shares are reduced in par value without a prorata increase in the number of shares, the resulting surplus must be credited to Paid-in Surplus.[24]

**Quasi-reorganization and "dated" earned surplus.** When a corporation has operated at a loss for a series of years and perhaps has accumulated an "earned deficit" on the books, the question may arise as to whether the owners might not be better off if they recognize (in effect) their loss of contributed capital and secure a "fresh start." For instance, the fresh start may lead other investors to invest in the business; with the added capital and the psychological incentive the corporation may eventually recover its earning power and become successful in its field.

Quasi-reorganizations take place within the confines of one corporate legal entity. They are usually carried out through the technique of reducing the par value (or stated value of no-par stock) without, however, increasing the number of shares outstanding. This means that a certain amount of paid-in (reduction) surplus is created on the books, against which the earned deficit is written off by a debit to the Reduction Surplus and a credit to the Earned Deficit account. Any earned surplus accumulated after the effective date of this entry is "dated," that is, the words "earned since ——" are placed immediately after the title "Earned Surplus" on subsequent balance sheets. For instance, the December 31, 1941, balance sheet of the Packard Motor Car Company refers to "Earned Surplus since May 1, 1935, $3,456,228.36."

[24] Baumann, 65 *Journal of Accountancy* 520–521.

A quasi-reorganization is sometimes referred to as an "accounting reorganization," since it does not have the legal formality associated with it as in the case of statutory reorganizations, or reorganizations carried out under the various bankruptcy laws. In practice, a quasi-reorganization is recommended by the board of directors to the stockholders for approval.

In addition to the possible elimination of an earned deficit from the books through a quasi-reorganization, the stockholders may also at the same time write off certain worthless assets against the reduction surplus created by the decrease in the par or stated value of the capital stock. This reduction in the asset recorded amounts, in the case of property subject to depreciation, depletion, or amortization, has the tendency to increase the periodic net income in future years, since the asset expiration charge will be smaller. This matter, of course, bears on the problem of reporting the periodic progress of the business unit and is discussed in Chapters 13 and 14 of this volume.

Quasi-reorganizations have been the subject of an official pronouncement of the Committee on Accounting Procedure of the American Institute of Accountants (*Research Bulletin No. 3*), a portion of which is by permission quoted below:

*Procedure in readjustment.* If a corporation elects to bring about a legitimate restatement of its assets, stock, and surplus through readjustment and thus avail itself of the permission to relieve its future income account or earned surplus account of charges which should otherwise be made thereagainst, it should make a clear report to the stockholders of the restatements proposed to be made, and obtain their formal consent. It should present a fair and conservative balance sheet as at the date of the readjustment, in which assets and liabilities should be so stated that no artificial credits will arise from realizations of the assets or discharge of the liabilities. Furthermore, the readjustment of values should be reasonably complete, in order that there be no continuation of the circumstances which justify charges to capital surplus.

The effective date of the readjustment from which the income of the company is thereafter determined and which is included in its dated earned surplus account should be as near as practicable to the date on which formal consent of the stockholders is given, and should ordinarily not be prior to the close of the last completed fiscal year.

When the amounts to be written off have thus been determined, they should be charged first against earned surplus to the full extent thereof; the balance may then be charged against capital surplus. A company which has subsidiaries should apply this rule in such a way that no consolidated earned surplus will be carried through a readjustment in which some losses have been charged to capital surplus.

If the earned surplus of any subsidiaries cannot be applied against the losses before resort is had to capital surplus, the parent company's interest therein should be regarded as capitalized by the readjustment, just as surplus at the date of acquisition is capitalized, so far as the parent is concerned.

Understatement as at the effective date of the readjustment of assets which are likely to be realized thereafter, though it may result in conservatism in the balance

sheet at that date, may also result in overstatement of earnings or of earned surplus when the assets are subsequently realized. Therefore, in general, assets should be carried forward as of the date of readjustment at a fair and not unduly conservative value, determined with due regard for the accounting rules to be employed by the company thereafter. If the fair value of any asset is not readily determinable a conservative estimate may be made, but in that case the item should be described as an estimate and any material difference in value subsequently shown (by realization or otherwise) to have existed at that date should not be carried to earned surplus.

*Procedure after readjustment.* When the readjustment has been completed, the company's accounting should be substantially similar to that appropriate for a new company.

After such a readjustment, as already stated, previously earned surplus cannot properly be carried forward under that title. A new earned surplus account should be established, described as from the effective date of the readjustment.

The following quotations from accounting releases of the Securities and Exchange Commission are also pertinent:

*Description of surplus accruing subsequent to effective date of quasi-reorganization.* . . . sound accounting practice ordinarily requires that a clear report be made to stockholders of the proposed restatements and that their formal consent thereto be obtained. In such a situation it is also essential . . . that full disclosure of the procedure be made in the financial statements for the fiscal year involved and that any subsequent statements of surplus should designate the point of time from which the new earned surplus dates.

Furthermore, in view of the importance of such proceedings, I am of the opinion that until such time as the results of operations of the company on the new basis are available for an appropriate period of years (at least 3) any statement or showing of earned surplus should, in order to provide additional disclosure of the occurrence and the significance of the quasi-reorganization, indicate the total amount of the deficit and any charges that were made to capital surplus in the course of the quasi-reorganization which would otherwise have been required to be made against income or earned surplus.[25]

*Disclosure of charge of deficit to capital surplus without approval of stockholders.* Inquiry has frequently been made as to the disclosure necessary in financial statements filed with the Commission under the Securities Act of 1933 or the Securities Exchange Act of 1934 when a company has charged a deficit to capital surplus without approval of the stockholders. In a typical case it was indicated that a company on January 1, 1939, had a deficit of $800,000 and a capital surplus of $1,500,000 arising out of the excess of the amount paid in for its stock over the par value thereof and that earned surplus since January 1, 1939, amounted to $100,000. By resolution of the board of directors, dated January 16, 1939, but without approval of the stockholders, the deficit had been charged off to capital surplus. I am informed that under the applicable state law it was permissible to effect this restatement without approval of the stockholders.

From the facts of this case it appeared that the company sought to effect a quasi-reorganization such as is referred to in *Accounting Series Release No. 15.* However, as there stated, it is my opinion that in such cases sound accounting practice ordi-

[25] *Accounting Series Release No. 15.*

narily requires that a clear report be made to stockholders of the proposed restatement and that their formal consent thereto be obtained. If, however, under the applicable state law it is permissible to eliminate a deficit without obtaining the formal consent of stockholders and if such consent of stockholders is not obtained, it is necessary in my opinion to make a complete disclosure of all the attendant facts and circumstances and their effect on the company's financial position in each balance sheet and surplus statement filed with the Commission thereafter.

Under the circumstances of the case cited, it is my opinion that, to effect the minimum appropriate disclosure in the surplus accounts, information should be given in respect of subsequent earned surplus in approximately the following fashion:

| | | |
|---|---|---|
| Total deficit to December 31, 1939 | $700,000 | |
| Less deficit at January 1, 1939, charged to capital surplus by resolution of the board of directors and without approval of stockholders, such action being permissible under the applicable state law | 800,000 | |
| Earned Surplus since January 1, 1939 | | $100,000 |

As an additional disclosure in situations to which the provisions of this release are applicable it has been the administrative policy of the Commission to require that in the registration statement or other filing containing financial statements first reflecting such action by the directors there be included an explanation of the action taken and an indication of its possible effect on the character of future dividends. As an example of an appropriate disclosure, there may be cited the following paragraph:

"It should be noted that on _____ by action of the board of directors, without action by the stockholders, the company charged off a $_____ deficit in earned surplus against its capital surplus. This procedure will permit the company in the future to reflect undistributed earnings subsequent to _____ as earned surplus, instead of as a reduction of the deficit charged off to capital surplus. One result of this procedure is to permit the distribution, as ordinary dividends, of earned surplus accruing subsequent to _____, without regard to the deficit charged off to capital surplus. Furthermore, if earnings subsequent to _____ are less than the deficit written off, distributions thereof may in effect represent distributions of capital or capital surplus." [26]

*Procedure in quasi-reorganization.* Inquiry has been made from time to time as to the conditions under which a quasi-reorganization may be said to have been effected. The term "quasi-reorganization" has come to be applied in accounting to the corporate procedure in the course of which a company, without the creation of a new corporate entity and without the intervention of formal court proceedings, is enabled to eliminate a deficit whether resulting from operations or the recognition of other losses or both and to establish a new Earned Surplus account for the accumulation of earnings subsequent to the date selected as the effective date of the quasi-reorganization.

It has been the Commission's view for some time that a quasi-reorganization may not be considered to have been effected unless at least all of the following conditions exist:

1. Earned surplus as of the date selected is exhausted;

[26] *Accounting Series Release No. 16.*

2. Upon consummation of the quasi-reorganization no deficit exists in any surplus account;

3. The entire procedure is made known to all persons entitled to vote on matters of general corporate policy and the appropriate consents to the particular transactions are obtained in advance in accordance with the applicable law and charter provisions;

4. The procedure accomplishes with respect to the accounts substantially what might be accomplished in a reorganization by legal proceedings — namely, the restatement of assets in terms of present conditions as well as appropriate modifications of capital and capital surplus, in order to obviate so far as possible the necessity of future reorganizations of like nature.

It is implicit in such a procedure that reductions in the carrying value of assets at the effective date may not be made beyond a point which gives appropriate recognition to conditions which appear to have resulted in relatively permanent reductions in asset values; as for example, complete or partial obsolescence, lessened utility value, reduction in investment value due to changed economic conditions, or, in the case of current assets, declines in indicated realization value. It is also implicit in a procedure of this kind that it is not to be employed recurrently but only under circumstances which would justify an actual reorganization or formation of a new corporation, particularly if the sole or principal purpose of the quasi-reorganization is the elimination of a deficit in earned surplus resulting from operating losses.

In the case of the quasi-reorganization of a parent company it is an implicit result of such procedure that the effective date should be recognized as having the significance of a date of acquisition of control of subsidiaries. Hence, dividends subsequently received from subsidiaries should be treated as income only to the extent that they are declared by subsidiaries out of earnings subsequent to the effective date. Likewise, in consolidated statements, earned surplus of subsidiaries at the effective date should be excluded from earned surplus on the consolidated balance sheet.[27]

**Capital surplus.** The term, "capital surplus," is frequently used merely as a short and convenient way of expressing the idea of "all surplus other than earned surplus." Occasionally, capital surplus is defined as the excess of contributed capital over legal capital;[28] this definition, of course, excludes revaluation surplus from capital surplus. Because of its vagueness, the term should never be used as an account title; it is sometimes used as a caption on the balance sheet if the items included therein are classified.

**Paid-in surplus.** According to the American Institute of Accountants' Committee on the Definition of Earned Surplus:

> Paid-in surplus is the amount received from the sale or exchange of capital stock in excess of its par or stated value; the excess of the par or stated value of capital stock retired over the amount paid therefor; profits on resale of treasury stock; and surplus arising from a recapitalization. Paid-in (or donated) surplus also includes donations to a corporation by its stockholders or others of cash, profits, and capital stock.[29]

[27] *Accounting Series Release No. 25.*
[28] Marple, 9 *Accounting Review* 75.
[29] 6 *Accounting Review* 212 (quoted by permission).

The foregoing definition of paid-in surplus, which is really a list of the sources of paid-in surplus rather than an explanation of the meaning of the term, is the result of the historical development of the accounting theory concerning surplus. Originally the term, "surplus," was used without an adjective. Later, surplus was divided into earned surplus and capital surplus. Still later, capital surplus was subdivided into paid-in surplus and revaluation surplus. The division of surplus into earned, paid-in, and revaluation surplus is satisfactory in practice.

Logically, paid-in surplus should be defined as the excess of the contributed capital over the amount thereof allocated to the capital stock. This definition differs from the Institute definition by excluding gifts from outsiders from paid-in surplus.

In order to indicate the trend in capital and paid-in surplus terminology the following table is presented based on a survey of a limited number of prominent firms:

**Capital Surplus — Terminology**[30]

Percentage of Total Cases

| | 1933 | 1935 | 1937 | 1939 | 1941 | 1946 |
|---|---|---|---|---|---|---|
| Total cases | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| No such item shown | 41.2 | 40.5 | 36.2 | 34.9 | 33.5 | 23.9 |
| Cases showing capital surplus | 58.8 | 59.5 | 63.8 | 65.1 | 66.5 | 76.1 |
| Terms used: | | | | | | |
| Capital surplus | 39.0 | 41.5 | 43.5 | 47.5 | 48.7 | 55.5 |
| Paid-in surplus | 10.0 | 8.1 | 9.9 | 9.3 | 9.4 | 15.2 |
| Surplus arising from revaluation of property | 3.4 | 3.4 | 3.5 | 2.1 | 2.2 | 0.6 |
| Surplus of subsidiaries at acquisition | 1.6 | 0.8 | 0.2 | ..... | ..... | 0.2 |
| Initial surplus | 1.2 | 1.0 | 0.5 | 0.6 | 0.4 | 0.6 |
| Capital and paid-in surplus (in one amount) | 1.2 | 1.1 | 0.7 | 0.6 | 1.4 | ..... |
| Capital surplus and paid-in surplus (separately) | 0.2 | 1.0 | 0.2 | 0.2 | 0.6 | .... |
| Capital surplus paid in | 1.0 | 1.1 | 1.0 | 0.7 | 1.0 | 0.7 |
| Premium on capital stock | ..... | ..... | 0.8 | 1.0 | 0.2 | ..... |
| All other designations | 1.2 | 1.5 | 3.5 | 3.1 | 2.6 | 3.3 |

A moderate number of companies are still using the Capital Surplus account to record various kinds of transactions, as shown in the statistics on the following page.[31]

[30] Sanders, T. H., *Company Annual Reports* (Boston: Harvard University Press, 1949), p. 328. (Based on 500 companies for years 1933–1941, and 525 companies in 1946.)

[31] Quoted by permission from *Accounting Techniques Used in Published Corporate Annual Reports, 1949*, pp. 88–91 (prepared by Research Department of the American Institute of Accountants).

CAPITAL SURPLUS CHARGES:

| 1948 | 1947 | 1946 | |
|---|---|---|---|
| 27 | 46 | 51 | Resulting from purchase and sale of stock |
| 12 | 5 | 18 | Transfers to capital stock |
| 3 | 11 | 15 | Write-off of goodwill |
| 3 | 8 | 6 | Transfers to earned surplus |
| 1 | 3 | 3 | Appropriations |
| 5 | 6 | 5 | Consolidation, merger, and recapitalization entries |
| 9 | 7 | 3 | Miscellaneous |
| 60 | 86 | 101 | |

CAPITAL SURPLUS CREDITS:

| 1948 | 1947 | 1946 | |
|---|---|---|---|
| 53 | 48 | 79 | Premium on issuance of capital stock |
| 17 | 17 | 26 | Conversion of capital stock into another issue of same company |
| 3 | 4 | 13 | Exchange of capital stock for that of other company |
| 38 | 27 | 26 | Treasury stock — purchase and retirement (and issuance in 1946) |
| 8 | 14 | .. | Treasury stock — sale and distribution |
| 5 | 12 | 20 | Stock options and warrants |
| 6 | 6 | 11 | Restoration or realization of assets previously written off |
| 8 | 8 | 10 | Merger and consolidation adjustments |
| 10 | 6 | 7 | Transferred from reserves |
| 5 | 8 | 6 | Negative goodwill |
| 20 | 8 | 5 | Stock dividends |
| 1 | 2 | 5 | Change in equity in unconsolidated subsidiary |
| 6 | 3 | 3 | Transfers from earned surplus |
| 17 | 18 | 8 | Miscellaneous |
| 197 | 181 | 219 | |

**Donated surplus.** It is unfortunate that the term, "donated surplus," is quite frequently used in connection with gifts to the corporation by stockholders; such gifts are a part of contributed capital and should be considered paid-in surplus (miscellaneous). The accounting for donated treasury stock is discussed in Chapter 3.

While unconditional gifts and the remission of debts by non-stockholders are sometimes treated as earned surplus,[32] they are usually considered to be paid-in surplus (miscellaneous).[33] As such gifts are not taxable income to the corporation,[34] it may be desirable to keep them out of the Earned Surplus account. However, gifts and remissions of debts by non-stockholders do not

[32] (1936) Marple 136; Accounting Questions Section, 58 *Journal of Accountancy* 236.
[33] (1937) Montgomery 574; (1932) Paton 933; Accounting Questions Section, 58 *Journal of Accountancy* 235; (1931) Sunley-Pinkerton 120; (1924) Couchman 198–199; (1947) Langer, Lecture 6, p. 2 (credited Paid-in Surplus (General) account).
[34] *Bothin Real Estate Co. v. Com'r.*, 90 Fed. (2nd) 91.

constitute contributed capital. As paid-in surplus is always contributed capital, unconditional gifts and remission of debts by non-stockholders should be credited to a special surplus account entitled "Donated Surplus." A statement of surplus, for example, of the San Antonio Public Service Corporation used the account title "Contributions for Extension."

**Résumé of surplus classifications.** As the classes of surplus should be related to the classes of business capital, the following account titles are recommended for the recording of corporate capital:

1. Capital realized from non-owners should be recorded in:
   a. Donated Surplus (gifts and remission of debts by outsiders), and
   b. Earned Surplus (all other items).
2. Capital contributed by stockholders should be recorded in:
   a. Capital Stock (par or stated value), and
   b. Paid-in Surplus (all other items). (See Chapter 2 for possibility of subdividing this account into
      (1) Paid-in Surplus Contributed by Present Stockholders, and
      (2) Paid-in Surplus — Miscellaneous.)
3. Capital caused by unrealized appreciation should be recorded in: Revaluation Surplus (or, Reserve for Unrealized Appreciation).

**Premium and discount on capital stock.** The generally accepted standards involving premium and discount on capital stock are:

1. An account (or accounts) should be set up to take care of the difference between par (or stated value of no-par stock) and the sale price of the stock. As indicated in a previous chapter, these accounts should be called (1) Paid-in Surplus from Present Preferred Stock (if any preferred stock is issued), and (2) Paid-in Surplus from Present Common Stock. If permitted by state law these accounts may have debit balances. (The title would then become "Deficiency in Par or Stated Value Not Paid In.")
2. Both of the accounts just noted constitute a part of paid-in surplus. While discount on capital stock is occasionally treated as a deferred charge,[35] this practice is going out of use.

Corporations subject to the provisions of the Federal Power Act (1) must maintain separate subsidiary accounts for the premiums and discount on each class and series of capital stock, (2) may amortize the balance of Account 150, Discount on Capital Stock, against earned surplus by charges to Account 414, Miscellaneous Debits to Surplus, and (3) when capital stock is retired and canceled, must debit Account 203, Premiums and Assessments on Capital Stock, for the amount in that account with respect to the shares of such stock retired and canceled, or must credit Account 150, Discount on Capital Stock, for the unamortized amount in that account with respect to the shares of such stock retired and canceled; the offsetting entry in both cases is to Account 270, Capital Surplus, pro-

[35] (1932) Altschuler 4.

vided that debits must be charged to Account 414, Miscellaneous Debits to (Earned) Surplus, if the amounts thereof exceed the balance in Capital Surplus; and provided further, that in no event may debits in excess of accumulated credits for the retirement of stock be charged to Capital Surplus.[36]

*Past practices.* Many accountants in the past have recommended that separate accounts originally be established for recording (1) discounts and (2) premiums. At some subsequent time the separate accounts were often closed to Paid-in Surplus. In addition, some writers have in the past recommended that the Discount on Capital Stock account be closed against either Premium on Capital Stock, or Paid-in Surplus (if this account is on the books).[37] If there were no premium or paid-in surplus, the discount was often charged to Earned Surplus account,[38] but some writers held that such write-off constituted an illegal dividend if some stock were sold at a discount while other shares were sold at a premium.[39] (The present writers know of no cases covering this point.)

As noted in the previous chapter, the confusion in regard to premium and discount on capital stock may be avoided by setting up two (or three) Paid-in Surplus accounts for the various conflicting elements comprising it; these conflicting elements should not be closed against each other. Keeping the conflicting details in separate accounts is important because writing off the Discount on Capital Stock account against either the Premium on Capital Stock (Paid-in Surplus) account [40] or the Earned Surplus account [41] does not always relieve the contingent liability of the original stockholders who subscribe for the stock at less than par. This legal point should be watched carefully as the contrary view is sometimes found in accounting texts.[42] The once popular method of charging discount on capital stock to the Organization Cost account should never be adopted.[43]

It is illuminating to add (or subtract) the Paid-in Surplus from Present Stockholders to the Capital Stock account on the balance sheet to show the contributions made by the stockholders. However, the Paid-in Surplus (Miscellaneous) account should be listed among the other proprietorship items.

In Chapter 2 it was recommended that when no-par stock is handled according to the stated value method, any new shares should be recorded

[36] Federal Power Commission, *op. cit.*, pp. 13–14, 27, 29.
[37] (1931) Sunley-Pinkerton 40; (1923) Saliers 245.
[38] (1938) Bolon 349; (1936) MacFarland-Ayars 350; (1931) Sunley-Pinkerton 40.
[39] Fjeld, E. I., and Sherritt, L. W., *Advanced Accounting* (New York: College of City of New York, 1938), p. 176.
[40] (1927) Hatfield 204; (1927) Krebs 784–785.
[41] (1938) Paton 664–665; (1942) Holmes 109.
[42] (1934) Finney, I, 69; (1932) Altschuler 4.
[43] (1933) Kester 466.

as though the stated value was an unofficial par value. For instance, if the stated value were $10 a share, the sale of an additional share at $8 would involve a credit to No-par Capital Stock of $10 and a debit to Paid-in Surplus from Present Stockholders of $2. Some authorities disagree and would ignore the difference and credit $8 to No-par Capital Stock.[44] The present writers do not think it advisable to ignore the difference since (1) it tends to confuse the stated value and the consideration-received methods of accounting for no-par stock; and (2) because the stated value may be set by the charter, by the stockholders, or by the directors, but may not be set by the corporation's accountants.

When stock is issued as fully paid although not fully paid in fact, the stockholder cannot be sued for the discount by the corporation, but may be sued by the receiver on behalf of the creditors in case of bankruptcy. Usually, transferees, who without knowledge to the contrary acquire stock as fully paid and non-assessable, cannot be held for any unpaid portion of the subscription price or for any deficiency in the value received by the corporation in purported full payment of the stock.

**Donations from stockholders.** Any surplus arising from donations by the stockholders should be set up in adequately described Paid-in Surplus accounts. The journalization of donated treasury stock was developed in Chapter 3. All nonstock gifts from stockholders should be included among the assets at the fair market values and credited to the proper Paid-in Surplus. Salary waived by stockholders on account of a corporate deficit has been held to be paid-in surplus rather than income to the corporation.[45]

**Paid-in surplus from forfeited subscriptions.** As indicated in Chapter 2, the net receipts from the sale of stock covered by forfeited subscriptions are sometimes retained by the corporation. In the event these receipts are retained, they should be credited to Paid-in Surplus — Miscellaneous (From Forfeited Subscriptions).[46]

**Revaluation surplus.** This type of surplus arises from a recorded appraisal of assets and for this reason is sometimes called "Reappraisal Surplus." Because of the several accounting problems presented by such transactions, the whole matter is discussed at length in Chapter 11.

**Simple recapitalizations.** *Reduction in par or stated value without proportionate increase in number of shares.* The stockholders sometimes vote an amendment to the charter to reduce the par or stated value of the capital stock without a proportionate increase in the number of the shares in order (1) to reduce the franchise taxes which are frequently levied on the basis

[44] (1932) Paton 930.
[45] O.D. 1034, V C.B. 277.
[46] (1936) Marple 139; (1934) Finney, I, 78; (1946) Kester 449; (1949) Karrenbrock-Simons, I, 347.

of the par value of the stock (no-par often arbitrarily assigned a $100 value per share), (2) to reduce the stock transfer taxes (effect is about the same as franchise taxes), (3) to create some type of surplus against which an operating deficit can be written off, and (4) to create some type of surplus against which fixed asset values can be written down. When the old shares are replaced by the new shares, the old Capital Stock account is closed by a debit entry, the new Capital Stock account is set up by a credit entry for the new par or stated value of the new shares, and the Paid-in Surplus account is credited with the reduction in the par or stated capital of the corporation. (Since the Paid-in Surplus account is in many cases a controlling account, the specific subsidiary ledger account for this reduction in the total par or stated value may be called "Recapitalization Surplus," "Reorganization Surplus," or simply "Reduction Surplus.")

*Change from par value to no-par value stock.* If the stockholders vote to amend the charter, the old par value certificates may be replaced by new no-par certificates. If the aggregate stated or assigned value of the new no-par stock is the same as the aggregate par value of old stock, the Common Par Value Capital Stock account would merely be closed into the Common No-par Capital Stock account. If the aggregate stated or assigned value of the new no-par stock is less than the aggregate par value of the old stock, the difference would be credited to the Paid-in Surplus account. This type of transaction does not affect the Earned Surplus account because it is assumed that there is no important change in the ownership of the corporation. But in most states the directors are allowed, but are not compelled, to transfer earned surplus to stated capital.[47] As paid-in surplus is a part of contributed capital, it logically should be closed into stated capital although frequently it is not legally compulsory to do so;[48] the closing of paid-in surplus is especially desirable when the No-par Stock account is to be maintained upon the consideration-received method. If part or all of the premium on capital stock has been declared as dividends, only the existing paid-in surplus at the date of the exchange of stock should be closed into the No-par Capital Stock account. On the other hand, if the change from par value to no-par value stock is part of a reorganization program which involves major changes in the ownership of the corporation, the Earned Surplus account should be closed, along with the Common Par Value Capital Stock account, into the Common No-par Capital Stock account.

*Change from no-par to par value stock.* The old no-par certificates can be replaced by new par value certificates, if the stockholders vote to amend the charter. If there is no important change in the ownership of the cor-

[47] (1946) Kester 458.
[48] (1937) Montgomery 790.

poration, the Earned Surplus account may be kept intact, and the Common No-par Capital Stock account may be closed into the Common Par Value Capital Stock account along with the Paid-in Surplus account. (This allocation of part of the carrying value of the old no-par shares to Paid-in Surplus is optional.) If the change from no-par to par value stock is part of a reorganization program which involves major changes in the ownership of the corporation, the Earned Surplus account should be closed out along with the No-par Capital Stock account.

**Recorded surplus reserves.** In the early development and defining of earned surplus, most accountants and corporate managements viewed it as a buffer amount (or a residual sum) available for use as the directors might desire. These possible uses were few in number, the most popular being (a) to pay dividends, (b) to allow the corporation to expand its operations without additional stockholder investment, and (c) to comply with contractual obligations. As the years passed by, however, the practice developed of charging and crediting earned surplus with several additional varieties of items, most of which were concerned with (a) corrections of errors of past fiscal periods and (b) large unusual gains and losses of the current period which were deemed to be "nonoperating." Some corporate managements and their accountants also began to appropriate earned surplus for designated or undesignated contingencies and possible losses. The impoundments gradually became known as "appropriated earned surplus reserves," their purpose being to earmark earned surplus until the danger of the contingent loss is past. In brief, the setting up of these reserves has the effect of reducing temporarily (during the time the reserve is on the books) the amount of earned surplus available for dividends. The reserve does not "provide" for the loss, however, except insofar as the corporation might have relatively more liquid assets if the actual payment of dividends is limited by the creation of the type of reserve referred to above.

In recent years, the question of earned surplus reserves has received an unusual amount of attention, especially in connection with losses and costs occasioned by the war and reconversion.[49] A large number of reserves were established during the war period, some of which were created by charges to current income and some by charges to earned surplus. While the ultimate effect on earned surplus is the same in each case, the effect on the amount of reported periodic income is not identical. The problem is thus intimately associated with the question of the determination of periodic income, a subject discussed at length in Chapters 13 and

[49] See *Accounting Research Bulletin No. 13.* For account titles and sizes of the reserves, see *Report on Corporate War and Post-War Reserves, 1939–1942,* Securities and Exchange Commission.

14. At this point it is sufficient to observe that earned surplus reserves are established from, and are closed back into, the Earned Surplus account. During the time the reserves are on the books, they are reported on the balance sheet as items under the subsection "Earned Surplus." [50]

*Funded reserves.* Some earned surplus reserves are funded; that is, cash or securities are specifically earmarked in the accounts and statements. Funded reserves are generally established for (1) retiring bonds, (2) retiring preferred stocks, and (3) new plant construction, although a fund may be set up for any purpose the directors may desire. The amounts set aside in the funds may be handled by an outside trustee or by the corporation officials.[51] Usually the debit balance of the assets in the fund equals the credit balance in the related earned surplus reserve; occasionally, however, the balances are computed independently. A bond retirement fund, for example, might equal only three-fourths of the earned surplus reserve called "Reserve for Sinking Fund." [52]

**Unrecorded ("secret") surplus reserves.** Secret reserves may be created by:

1. Understating assets
   a. Writing off existing assets
   b. Charging capital expenditures to Profit and Loss
   c. Undervaluation of inventories
   d. Setting up insufficient deferred or prepaid expenses
2. Overstatement of valuation reserves
   a. Creation of excessive reserves for depreciation
   b. Creation of excessive reserves for doubtful accounts
3. Overstatement of liabilities
   a. Setting up of excessive deferred income
   b. Establishing nonexistent liabilities on the books

Secret reserves are created for one of two reasons: (a) intent to deceive or (b) paternalism of directors. At one time some accountants sanctioned the creation of such reserves if deception were not a primary motive. In 1905, for example, one authority [53] stated: "Opinions differ greatly as to the extent to which the formation of secret reserves is permissible; but it is thought that, within reasonable limits, the matter is one resting with the directors rather than with the auditor, so long as there is no suspicion of bad faith." In 1933, however, another authority [54] wrote: "It is, of course, apparent that no balance sheet containing secret reserves is a true

[50] *Accounting Research Bulletin No. 39.*
[51] (1944) Sunley-Carter 152–155.
[52] Depreciation and maintenance reserves are also sometimes funded. See Hosmer, 22 *Harvard Business Review* 369.
[53] Dicksee, L. R., *Auditing* (edited by R. H. Montgomery) (New York: The Business World, 1905), p. 195.
[54] (1933) Kester 552.

statement of condition and the practice of creating secret reserves must usually — perhaps always — be condemned." The law has made a similar shift. In 1906, Justice Buckley [55] said: "The purpose of the balance sheet is primarily to show that the financial position of the company is at least as good as there stated, not to show that it is not, or may not be better." In 1933, Section 11 of the Federal Securities Act charged the accountant, whose certification is given, with the responsibility of having made a reasonable investigation, and of having formed the belief that the statements covered by his certificate were true, and that there was no omission to state a material fact required to be stated therein or necessary to make the statements therein not misleading.

**Reconciliation of surplus and reported profits.** As indicated previously in this chapter, there are many kinds of surplus and it is easy to confuse them. In addition, problems involving the reconciliation and correction of reported profit for several years occasionally arise. A work sheet for handling the adjustments and reclassifications facilitates the preparation of the necessary required entries. The recommended form has five or more columns for Earned Surplus (depending upon the number of years involved), and one column each for Paid-in Surplus, Revaluation Surplus, Reserve for Sinking Fund (or other appropriated earned surplus reserves), and Balancing accounts. The last column merely represents the debits offsetting the credits in the various surplus accounts. Such a work sheet (see illustrative problem below) has two valuable checks on clerical accuracy: (1) the debits (designated by asterisks) and the credits on each horizontal line balance, and (2) the totals of money columns 5, 6, 7, 8, and 9 (counting from the left) must algebraically add to zero.

In using the work sheet, the balances as per the books (see problem below) are entered on the first line, the adjustments are given on the following lines, and the corrected balances are recorded on the last line. The "as per books" entry debits the final net surplus (regardless of kind) to the Balancing account, credits the Paid-in Surplus, Revaluation Surplus, and Sinking Fund Reserve accounts with their final balances, and distributes an analysis of the final earned surplus balance over columns 1, 2, 3, and 4. Column 1 records the initial earned surplus or deficit balance, columns 2 and 3 the annual book profits or losses, and column 4 the net sum of the items debited and/or credited directly to Earned Surplus during the years involved. The earned surplus balance as per the books is not entered in column 5 at the start, as that would mean the balance would be on the work sheet twice. However, the adjusted earned surplus or deficit balance is collected in column 5 after the analysis of this balance has been corrected in columns 1, 2, 3, and 4.

[55] Quoted in (1927) Hatfield 323.

The compound entry needed to correct the books for changes affecting the surplus accounts may be read from the adjustments in columns 6, 7, 8, and 9. The statement of surplus may readily be prepared from the itemized data on the work sheet; one column should be taken at a time, working from left to right, except that the direct items in the "as per books" figure in column 4 must be analyzed and inserted in the statement in the proper time sequence (see next section for a discussion).

### *Illustrative Problem*

The X Company had the following surplus accounts on its books on December 31, 1950: Earned Surplus $280,000; Paid-in Surplus $200,000; Revaluation Surplus $400,000; and Sinking Fund Reserve $100,000. The Earned Surplus account was as follows:

**Earned Surplus**

| | | | |
|---|---|---|---|
| 1949 Dividends | $200,000 | Balance 1/1/49 | $250,000 |
| 1949 Sinking Fund Reserve | 100,000 | 1949 Profit and Loss | 450,000 |
| 1950 Profit and Loss | 50,000 | 1950 Receipts from officers' life insurance policy in excess of cash surrender value | 30,000 |
| 1950 Dividends | 100,000 | | |
| Balance 12/31/50 | 280,000 | | |
| | $730,000 | | $730,000 |

No entries were made in the Paid-in Surplus and Revaluation Surplus accounts during 1949 and 1950. On January 1, 1948, a 5-year fire insurance policy, premium $5,000, was written off to Profit and Loss. The receipts from the officers' life insurance policy in excess of its cash surrender value should be considered income for 1950. The 1950 addition to the Sinking Fund Reserve of $100,000 should be made. In 1950, treasury stock was purchased at a discount of $12,000 (treated as a profit). The remaining life of the appreciated fixed assets was set by an appraisal made on January 1, 1949, as 40 years; depreciation based on the reproduction, new, valuation has been charged to Profit and Loss (to be considered correct) but the Revaluation Surplus account (same as Reserve for Unrealized Appreciation) has not yet been adjusted.

Set up a work sheet reconciling surplus and profits and prepare the entry needed to correct the books.

### *Solution*

The required work sheet reconciling surplus and profits is on page 131.

**Correcting Entry**

| | | |
|---|---|---|
| Unexpired Insurance | $ 2,000 | |
| Earned Surplus ($280,000–$190,000) | 90,000 | |
| Revaluation Surplus (Reserve for Unrealized Appreciation) | 20,000 | |
| Paid-in Surplus (Miscellaneous) | | $ 12,000 |
| Sinking Fund Reserve | | 100,000 |

## Work Sheet Reconciling Surplus and Profits

(000 omitted)

| | Earned Surplus | | | | Paid-in Surplus | Reval-uation Surplus | Sinking Fund Reserve | Balancing Accounts | |
|---|---|---|---|---|---|---|---|---|---|
| | 1/1/49 Balance Dr.*; Cr. | Profit and Loss 1949 | Profit and Loss 1950 | Direct Items Dr.*; Cr. | 12/31/50 Balance Dr.*; Cr. | 12/31/50 Dr.*; Cr. | 12/31/50 Dr.*; Cr. | 12/31/50 Dr.*; Cr. | Amount Dr.*; Cr. | Accounts Affected |
| As per books | $250 | $450 | $50* | $370* | .... | $200 | $400 | $100 | $980* | Various |
| Adjustment: | | | | | | | | | | |
| Fire insurance | 4 | 1* | 1* | .... | .... | .... | .... | .... | 2* | Unexpired Insurance |
| Life insurance | .... | .... | 30 | 30* | .... | .... | .... | .... | .... | |
| Sinking fund reserve (1950) | .... | .... | ... | 100* | .... | .... | .... | 100 | .... | |
| Discount on treasury stock | .... | .... | 12* | .... | .... | 12 | .... | .... | .... | |
| Appreciation | .... | .... | ... | 20 | .... | .... | 20* | .... | .... | |
| Corrected earned surplus 1/1/49 balance | $254 | .... | ... | .... | $254 | .... | .... | .... | .... | |
| Corrected 1949 profit | | $449 | ... | .... | 449 | .... | .... | .... | .... | |
| Corrected 1950 loss | | | $33* | .... | 33* | .... | .... | .... | .... | |
| Corrected direct items (see schedule) | | | | $480* | 480* | .... | .... | .... | .... | |
| Final balances | | | | | $190 | $212 | $380 | $200 | $982* | |

*Direct items schedule.* Whenever the analysis of the direct charges and credits to Earned Surplus is not obvious, a special schedule should be prepared in order that the various items and dates thereof may be presented for entering in the statement of surplus.

**Direct Items Schedule**

| | As per books Dr.*; Cr. | Adjustments Dr.*; Cr. | Corrected Dr.*; Cr. |
|---|---|---|---|
| 1949 Dividends | $200,000* | ..... | $200,000* |
| 1949 S.F. Reserve | 100,000* | ..... | 100,000* |
| 1950 Dividends | 100,000* | ..... | 100,000* |
| 1950 Life insurance | 30,000 | $ 30,000* | ..... |
| 1950 S.F. Reserve | ..... | 100,000* | 100,000* |
| 1949 Appreciation | ..... | 10,000 | 10,000 |
| 1950 Appreciation | ..... | 10,000 | 10,000 |
| | $370,000* | $110,000* | $480,000* |

*Correction of income taxes.* Whenever the income taxes must be re-computed, three additional lines should be inserted in the work sheet above the Corrected Earned Surplus Initial Balance line, with the following headings:

1. Prior Provision for Income Taxes, crediting annual income accounts or Earned Surplus (initial balance) and debiting Income Taxes Payable.
2. Net Income before Income Taxes, inserting sums of figures for each year's income.
3. Corrected Provisions for Income Taxes, debiting annual income accounts or Earned Surplus (initial balance) and crediting Income Taxes Payable. Refunds should usually be set up as assets rather than reductions from Income Taxes Payable.

*Relation to ordinary financial statement work sheets.* The work sheet reconciling surplus and profits may be very useful if it is desired to adjust the trial balance for each of the years under audit to show the correct balances of the accounts affected. The adjusting entries for any one year may be read from the work sheet reconciling surplus and profits as on each line the entries in the Profit and Loss column of the year in question affect an expense or income of that year. The algebraic sum of the entries on the same line in the columns to the left affect Earned Surplus and the algebraic sum of the entries on the same line in the columns to the right affect balance sheet accounts. For instance, the first adjustment on the illustrative work sheet reconciling surplus and profits on page 131 calls for the following entries to be posted to the unadjusted trial balances:

| | December 31, 1949 | | December 31, 1950 | |
|---|---|---|---|---|
| Unexpired Insurance | $3,000 | | $2,000 | |
| Insurance Expense | 1,000 | | 1,000 | |
| Earned Surplus | | $4,000 | | $3,000 |

**Work sheets for correcting financial statements.** The work sheets available for use in correcting a series of financial statements may be divided into three classes:

1. Those starting with a trial balance for each year
2. Those starting with informal annual statements with the debit and credit balances in separate columns
3. Those starting with formal classified annual statements

As the first and second classes of work sheets are usually described in textbooks designed for intermediate accounting students, they are omitted here. In order to facilitate the reader's reviewing the elementary forms of work sheets while studying the more advanced form, this volume illustrates the use of the Class No. 3 work sheet with the same data used in the presentation of Class No. 1 and Class No. 2 work sheets in Newlove-Smith-White, *Intermediate Accounting*, Revised (pp. 309–318).

Class No. 3 work sheets may vary somewhat in form depending on the formal statements which later will be prepared from them. The variations are as follows:

1. Balance sheets, income statements, and earned surplus statements for all years (these work sheets are illustrated below; the other work sheets are not illustrated to save space, but instructions for their preparation are given)
2. Balance sheets and income statements for all years, but no earned surplus statements
3. Balance sheet for last year only with income statements and earned surplus statements for all years
4. Balance sheet for last year only, with income statements for all years, but no earned surplus statements

The adjustments on Class No. 3 work sheets follow the usual debit and credit rules except that compound entries are scattered over different sections of the work sheets. Frequently, considerable time can be saved if compound entries are first taken off a "reconciling earned surplus and net income" work sheet and entered on Class No. 3 work sheets; this is especially true if the balance sheet for only the last year is to be prepared, along with income and earned surplus statements for all years.

The entries interlocking the different parts of Class No. 3 work sheets are:

1. Entry transferring net change in final balance of earned surplus of prior year
2. Entry transferring net change in periodic income
3. Entry transferring net change in final balance of earned surplus of current year

Practicing public accountants may use the Reference column on Class No. 3 work sheets to index the adjustments to their audit working papers.

*Suggested work sheet procedure when all statements are to be prepared.* For each year involved set up a sheet having columns for "per books," "refer-

## DATA TAKEN FROM BOOKS

| | Cash | Receivables | Initial Inventory | Final Inventory | Fixed Assets | Payables | Capital Stock | Earned Surplus | Net Profits | Sales | Purchases | Expenses | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Selling | General | Interest |
| Trial Balances: | | | | | | | | | | | | | | |
| 12/31/45..... | 8 | 20 | 30 | ... | 50 | 5 | 75 | 25 | ... | 120 | 90 | 15 | 10 | 2 |
| 12/31/46..... | 28 | 25 | 35 | ... | 50 | 17 | 75 | 33 | ... | 125 | 87 | 12 | 11 | 2 |
| 12/31/47..... | 33 | 32 | 32 | ... | 50 | 14 | 75 | 43 | ... | 127 | 85 | 15 | 10 | 2 |
| Balance Sheets: | | | | | | | | | | | | | | |
| 12/31/45..... | 8 | 20 | ... | 35 | 50 | 5 | 75 | 25 | 8 | ... | ... | ... | ... | ... |
| 12/31/46..... | 28 | 25 | ... | 32 | 50 | 17 | 75 | 33 | 10 | ... | ... | ... | ... | ... |
| 12/31/47..... | 33 | 32 | ... | 30 | 50 | 14 | 75 | 43 | 13 | ... | ... | ... | ... | ... |
| Profit and Loss: | | | | | | | | | | | | | | |
| 1945..... | ... | ... | 30 | 35 | ... | ... | ... | ... | 8 | 120 | 90 | 15 | 10 | 2 |
| 1946..... | ... | ... | 35 | 32 | ... | ... | ... | ... | 10 | 125 | 87 | 12 | 11 | 2 |
| 1947..... | ... | ... | 32 | 30 | ... | ... | ... | ... | 13 | 127 | 85 | 15 | 10 | 2 |

## OMISSIONS AND ERRORS ON BOOKS[1]

| Dec. 31 | Inventory | | Prepaid | | Accrued | | Reserves | |
|---|---|---|---|---|---|---|---|---|
| | Overvalued | Undervalued | Advertising | Insurance | Sales Salaries | Rent | Bad Debts | Depreciation |
| 1945..... | A 4 | ... | B 1 | C 2 | D 2 | E 1 | F 1 | G 2 |
| 1946..... | H 3 | ... | I 2 | J 3 | K 2 | L 1 | M 1 | N 2 |
| 1947..... | ... | P 2 | Q 3 | R 1 | S 1 | T 2 | U 1 | V 2 |

[1] Letters are inserted in the table so that the items can be traced on the work sheets; the adjustments for an item have the same letter as the item has in the table.

ence," "increases — decreases*," and "adjusted." Valuation reserves may be shown in red or the assets may be listed at a net figure. The income statement items are placed one after the other at the top of the sheet, followed by the earned surplus items. Finally, the balance sheet accounts are listed.

1. If there are adjustments which affect the earned surplus balance at the beginning of the time interval covered by the work sheets, record the net change in the earned surplus of the prior year on the initial balance line of the earned surplus statement for the first year of the time period; the offsetting increases and decreases for this net change in the beginning balance of earned surplus are entered as adjustments to the first year income statement items (if they pertain to inventories, expenses, or revenues), and to the balance sheet for the first year-end (if they pertain to other matters). See entries (6) and (7) in the following work sheets for illustrations of these adjustments.

2. The net adjustment to the income of each year is recorded on the net income line of both the income statement and the earned surplus statement.

3. The net adjustment to the earned surplus balance on the earned surplus statement at the end of each succeeding year must be entered on the earned surplus line of the same year-end balance sheet. This will allow each of the respective balance sheet totals to equal the same sum; of course, the year-end earned surplus must be the same on both the earned surplus statement and the balance sheet.

*Suggested work sheet procedure when all balance sheets and income statements are to be prepared but no earned surplus statements.* The procedure in this instance is similar to that outlined above except that all adjustments affecting the earned surplus balances must be recorded on the respective balance sheet lines headed "earned surplus." This rule applies even to items pertaining to fiscal periods prior to the date of the series of statements which are to be corrected, but discovered during the period being corrected. Specifically, the net change in earned surplus of each prior year is recorded on the line for earned surplus on the balance sheet for the next year; the adjustments to inventories, expenses, and revenues are then entered on the income statement of the following year, while all other adjustments are entered on the balance sheet for the end of the same following year.

*Suggested work sheet procedure when all income and earned surplus statements are to be prepared but balance sheet for last year-end only.* The basic form of the work sheet in this instance is similar to the ones described above. The income and earned surplus statements for each year are arranged one after the other, while the balance sheet for the last year-end is placed at the end of the series.

1. Corrections of the periodic income of each year of the series are entered in a compound entry opposite the inventories, expense, and revenue items on the several income statements constituting the series.

2. The net changes in the last year-end balance sheet accounts are recorded in the adjustment column of the work sheet opposite the balance sheet items.

3. The net adjustment in the periodic income for each year is entered on both the net income line of the income statement and the net income line of the earned surplus statement.

4. The corrected balance of earned surplus (shown on the last earned surplus statement) as of the end of the last year of the series must agree with the balance of earned surplus on the final balance sheet. The entry to accomplish this should be the last one made on the work sheet.

*Suggested work sheet procedure when all income statements are to be prepared (but no earned surplus statements) and only a balance sheet for the last year-end.* The basic form of the work sheet in this instance is similar to the ones described above. The income statements are arranged one after the other with the single final balance sheet at the end of the series.

1. Correction entries are made in compound fashion to the various inventory, expense, and revenue items on the several income statements; if any of these entries affect the last year-end balances of assets and liabilities, they are recorded opposite the appropriate asset or liability line — otherwise, the offsetting increase or decrease is entered opposite the earned surplus line of the final balance sheet.

2. Record the algebraic effect of net changes in periodic income shown on the last lines of all the income statements as a single figure opposite the earned surplus line of the end-of-the-period balance sheet. After this step has been accomplished, the final balance of earned surplus is extended to the last money column. The balance sheet totals may then be obtained; this will serve as a partial arithmetic proof of the accuracy of the work.

**CLASS NO. 3 WORK SHEETS**

(Using data on page 134)

**Work Sheet for Income Statement for 1945**

| | Per Books | Adjustments Ref. | Adjustments Inc.; Dec.* | Adjusted |
|---|---|---|---|---|
| Sales | 120 | ... | ... | 120 |
| Cost of Goods Sold: | | | | |
| Starting Inventory | 30 | ... | ... | 30 |
| Purchases | 90 | ... | ... | 90 |
| Total Available | 120 | ... | ... | 120 |
| Ending Inventory | 35 | A | 4* | 31 |
| Cost of Goods Sold | 85 | ... | ... | 89 |
| Gross Margin on Sales | 35 | ... | ... | 31 |

| | Per Books | Adjustments Ref. | Inc.; Dec.* | Adjusted |
|---|---|---|---|---|
| Gross Margin on Sales (per contra) | 35 | ... | ... | 31 |
| Expenses: | | | | |
| Selling Expense | 15 | B | 1* | 16 |
| | ... | D | 2 | ... |
| General Expense. | 10 | C | 2* | 12 |
| | ... | E | 1 | ... |
| | ... | F | 1 | ... |
| | ... | G | 2 | ... |
| Interest Expense | 2 | ... | ... | 2 |
| Total Expenses | 27 | ... | ... | 30 |
| Net Income | 8 | (1) | 7* | 1 |

**Work Sheet for Income Statement for 1946**

| | Per Books | Adjustments Ref. | Inc.; Dec.* | Adjusted |
|---|---|---|---|---|
| Sales | 125 | ... | ... | 125 |
| Cost of Goods Sold: | | | | |
| Starting Inventory | 35 | (3) | 4* | 31 |
| Purchases | 87 | ... | ... | 87 |
| Total Available | 122 | ... | ... | 118 |
| Ending Inventory | 32 | H | 3* | 29 |
| Cost of Goods Sold | 90 | ... | ... | 89 |
| Gross Margin on Sales | 35 | ... | ... | 36 |
| Expenses: | | | | |
| Selling Expense | 12 | (3) | 1* | 11 |
| | ... | I | 2* | ... |
| | ... | K | 2 | ... |
| General Expense. | 11 | (3) | 1 | 13 |
| | ... | J | 3* | ... |
| | ... | L | 1 | ... |
| | ... | M | 1 | ... |
| | ... | N | 2 | ... |
| Interest Expense | 2 | ... | ... | 2 |
| Total Expenses | 25 | ... | ... | 26 |
| Net Income | 10 | (4) | nil | 10 |

**Work Sheet for Income Statement for 1947**

| | Per Books | Adjustments Ref. | Inc.; Dec.* | Adjusted |
|---|---|---|---|---|
| Sales | 127 | ... | ... | 127 |
| Cost of Goods Sold: | | | | |
| Starting Inventory | 32 | (6) | 3* | 29 |
| Purchases | 85 | ... | ... | 85 |
| Total Available | 117 | ... | ... | 114 |
| Ending Inventory | 30 | P | 2 | 32 |
| Cost of Goods Sold | 87 | ... | ... | 82 |
| Gross Margin on Sales | 40 | ... | ... | 45 |

| | Per Books | Adjustments Ref. | Inc.; Dec.* | Adjusted |
|---|---|---|---|---|
| Gross Margin on Sales (per contra) | 40 | ... | ... | 45 |
| Expenses: | | | | |
| Selling Expense | 15 | Q | 3* | 13 |
| | ... | S | 1 | ... |
| General Expense | 10 | (6) | 2 | 16 |
| | ... | R | 1* | ... |
| | ... | T | 2 | ... |
| | ... | U | 1 | ... |
| | ... | V | 2 | ... |
| Interest Expense | 2 | ... | ... | 2 |
| Total Expenses | 27 | ... | ... | 31 |
| Net Income | 13 | (7) | 1 | 14 |

**Work Sheet for Earned Surplus Statement for 1945**

| | Per Books | Adjustments Ref. | Inc.; Dec.* | Adjusted |
|---|---|---|---|---|
| Balance, January 1, 1945 | 25 | ... | ... | 25 |
| Net Income for 1945 | 8 | (1) | 7* | 1 |
| Balance, December 31, 1945 | 33 | (2) | 7* | 26 |

**Work Sheet for Earned Surplus Statement for 1946**

| | Per Books | Adjustments Ref. | Inc.; Dec.* | Adjusted |
|---|---|---|---|---|
| Balance, January 1, 1946 | 33 | (3) | 7* | 26 |
| Net Income for 1946 | 10 | (4) | nil | 10 |
| Balance, December 31, 1946 | 43 | (5) | 7* | 36 |

**Work Sheet for Earned Surplus Statement for 1947**

| | Per Books | Adjustments Ref. | Inc.; Dec.* | Adjusted |
|---|---|---|---|---|
| Balance, January 1, 1947 | 43 | (6) | 7* | 36 |
| Net Income for 1947 | 13 | (7) | 1 | 14 |
| Balance, December 31, 1947 | 56 | (8) | 6* | 50 |

**Work Sheet for Balance Sheet as of December 31, 1945**

| | Per Books | Adjustments Ref. | Inc.; Dec.* | Adjusted |
|---|---|---|---|---|
| Current Assets: | | | | |
| Cash | 8 | ... | ... | 8 |
| Receivables | 20 | ... | ... | 20 |
| Reserve for Doubtful Accounts | ... | F | 1 | 1† |
| Inventory | 35 | A | 4* | 31 |
| Prepaid Advertising | ... | B | 1 | 1 |
| Prepaid Insurance | ... | C | 2 | 2 |
| Total Current Assets | 63 | ... | ... | 61 |

| | Per Books | Adjustments Ref. | Inc.; Dec.* | Adjusted |
|---|---|---|---|---|
| Total Current Assets (per contra) | 63 | ... | ... | 61 |
| Fixed Assets: | | | | |
| Fixed Assets | 50 | ... | ... | 50 |
| Reserve for Depreciation | ... | G | 2 | 2† |
| Total Fixed Assets | 50 | ... | ... | 48 |
| Total Assets | 113 | ... | ... | 109 |
| Current Liabilities: | | | | |
| Payables | 5 | ... | ... | 5 |
| Accrued Sales Salaries | ... | D | 2 | 2 |
| Accrued Rent | ... | E | 1 | 1 |
| Total Current Liabilities | 5 | ... | ... | 8 |
| Proprietorship: | | | | |
| Capital Stock | 75 | ... | ... | 75 |
| Earned Surplus | 33 | (2) | 7* | 26 |
| Total Proprietorship | 108 | ... | ... | 101 |
| Total Liabilities and Proprietorship | 113 | ... | ... | 109 |

† Denotes negative.

**Work Sheet for Balance Sheet as of December 31, 1946**

| | Per Books | Adjustments Ref. | Inc.; Dec.* | Adjusted |
|---|---|---|---|---|
| Current Assets: | | | | |
| Cash | 28 | ... | ... | 28 |
| Receivables | 25 | ... | ... | 25 |
| Reserve for Doubtful Accounts | ... | (3) | 1 | 2† |
| ... | ... | M | 1 | ... |
| Inventory | 32 | H | 3* | 29 |
| Prepaid Advertising | ... | I | 2 | 2 |
| Prepaid Insurance | ... | J | 3 | 3 |
| Total Current Assets | 85 | ... | ... | 85 |
| Fixed Assets: | | | | |
| Fixed Assets | 50 | ... | ... | 50 |
| Reserve for Depreciation | ... | (3) | 2 | 4† |
| ... | ... | N | 2 | ... |
| Total Fixed Assets | 50 | ... | ... | 46 |
| Total Assets | 135 | ... | ... | 131 |
| Current Liabilities: | | | | |
| Payables | 17 | ... | ... | 17 |
| Accrued Sales Salaries | ... | K | 2 | 2 |
| Accrued Rent | ... | L | 1 | 1 |
| Total Current Liabilities | 17 | ... | ... | 20 |
| Proprietorship: | | | | |
| Capital Stock | 75 | ... | ... | 75 |
| Earned Surplus | 43 | (5) | 7* | 36 |
| Total Proprietorship | 118 | ... | ... | 111 |
| Total Liabilities and Proprietorship | 135 | ... | ... | 131 |

† Denotes negative.

**Work Sheet for Balance Sheet as of December 31, 1947**

| | Per | Adjustments | | |
|---|---|---|---|---|
| Current Assets: | Books | Ref. | Inc.; Dec.* | Adjusted |
| Cash | 33 | ... | ... | 33 |
| Receivables | 32 | ... | ... | 32 |
| Reserve for Doubtful Accounts | ... | (6) | 2 | 3† |
| | ... | U | 1 | ... |
| Inventory | 30 | P | 2 | 32 |
| Prepaid Advertising | ... | Q | 3 | 3 |
| Prepaid Insurance | ... | R | 1 | 1 |
| Total Current Assets | 95 | ... | ... | 98 |
| Fixed Assets: | | | | |
| Fixed Assets | 50 | ... | ... | 50 |
| Reserve for Depreciation | ... | (6) | 4 | 6† |
| | ... | V | 2 | ... |
| Total Fixed Assets | 50 | ... | ... | 44 |
| Total Assets | 145 | ... | ... | 142 |
| Current Liabilities: | | | | |
| Payables | 14 | ... | ... | 14 |
| Accrued Sales Salaries | ... | S | 1 | 1 |
| Accrued Rent | ... | T | 2 | 2 |
| Total Current Liabilities | 14 | ... | ... | 17 |
| Proprietorship: | | | | |
| Capital Stock | 75 | ... | ... | 75 |
| Earned Surplus | 56 | (8) | 6* | 50 |
| Total Proprietorship | 131 | ... | ... | 125 |
| Total Liabilities and Proprietorship | 145 | ... | ... | 142 |

† Denotes negative.

**Statement of surplus.** The necessity of tying-in the financial statements has long been recognized by accountants, but the methods used have changed as the complexity of the accounting for surplus has increased. Originally, the details of the several surplus accounts were annexed to the balance sheet; then, when these details became too voluminous to be placed on the balance sheet (especially in the account form of the statement), the summary of the changes in Surplus account was sometimes added at the bottom of the income sheet. In more recent times, a separate statement (or statements) of surplus has been included in annual reports, frequently as a schedule supporting the surplus balances on the formal balance sheet. The evolution of the statement of surplus is not as yet complete, however, and many varied forms may be found in practice. For example, the question of combining the statement of income and the statement of earned surplus has been examined by authoritative accountants in the past few years.[56] This latter problem is closely associated with the determination

[56] *Accounting Research Bulletin No. 8;* Littleton, 69 *Journal of Accountancy* 30; York, 15 *Accounting Review* 380.

of periodic income, however, and is discussed more at length in Chapters 13 and 14.

If a separate single statement of surplus is prepared, it should carry separately the balance of each kind of surplus, from the figure shown on the starting balance sheet, to that shown on the final balance sheet at the end of the period. To fail to classify the different kinds of surplus is considered inadequate reporting; the Securities and Exchange Commission requires its registrants, therefore, to divide surplus into classes and to give a description of the various debits and credits made during the year.[57] The requisite classification may be provided by placing the sections for each kind of surplus under one another, or by having a column for each kind of surplus. The earned surplus reserves may be annexed to the statement of earned surplus under the caption, "Appropriated."

The statement of surplus for the illustrative problem given in the preceding section is as follows (assume that the "as per books" figures for 1949 had been given in published statements but that no statements have been published for 1950):

**X COMPANY**

**Statement of Surplus**

For Years Ending December 31, 1949, and December 31, 1950

| | | |
|---|---|---|
| EARNED SURPLUS: | | |
| Balance as per January 1, 1949, balance sheet | $250,000 | |
| Correction for unexpired fire insurance | 4,000 | |
| Corrected January 1, 1949, balance | | $254,000 |
| Add: | | |
| Appreciation realized through depreciation in 1949 | | 10,000 |
| 1949 profits: | | |
| Balance as per 1949 profit and loss statement | $450,000 | |
| Less correction for expired fire insurance | 1,000 | 449,000 |
| Total | | $713,000 |
| Deduct: | | |
| 1949 dividends | $200,000 | |
| 1949 addition to Sinking Fund Reserve account | 100,000 | 300,000 |
| Balance, December 31, 1949 | | $413,000 |
| Add: | | |
| Appreciation realized through depreciation in 1950 | | 10,000 |
| | | $423,000 |
| Deduct: | | |
| 1950 net loss | $ 33,000 | |
| 1950 dividends | 100,000 | |
| 1950 addition to Sinking Fund Reserve account | 100,000 | 233,000 |
| Balance, December 31, 1950 | | $190,000 |

[57] *Regulation S–X*, Rule 5–02.

| | |
|---|---|
| PAID-IN SURPLUS: | |
| Balance, January 1, 1949 | $200,000 |
| Discount on treasury stock purchased in 1950 | 12,000 |
| Balance, December 31, 1950 | $212,000 |
| REVALUATION SURPLUS: | |
| Balance, January 1, 1949 | $400,000 |
| Appreciation realized through depreciation in 1949 | 10,000 |
| Balance, December 31, 1949 | $390,000 |
| Appreciation realized through depreciation in 1950 | 10,000 |
| Balance, December 31, 1950 | $380,000 |
| SINKING FUND RESERVE: | |
| Addition in 1949 | $100,000 |
| Addition in 1950 | 100,000 |
| Balance, December 31, 1950 | $200,000 |

In order to illustrate a more complex possibility the following statements of surplus are presented dealing with an actual company. It should be observed that the various listed additions and deductions would not be handled by all accountants in exactly the same manner as given on the statements. These statements are given, therefore, for illustrative purposes only.

**MISSISSIPPI POWER COMPANY**

**Summary of Earned Surplus**

For the Year Ended December 31, 1941

| | Ten Months Ended October 31 | Two Months Ended December 31 | Total |
|---|---|---|---|
| Balance December 31, 1940, per previous Report | $394,246.22 | | $394,246.22 |
| Net income for the year ended December 31, 1941 | 282,048.44 | $81,526.10 | 363,574.54 |
| Credit to reflect cancellation of interest on $3,000,000 principal amount of First and Refunding Mortgage 5% Gold Bonds owned by the Commonwealth & Southern Corporation (Delaware) in compliance with agreement dated June 29, 1934, which provides that such interest shall be canceled if net income available for preferred stock dividends does not exceed twice preferred stock dividend requirements and/or dividends on preferred stock have not been paid to last preceding dividend date | 112,500.00 | | 112,500.00 |
| Total | $788,794.66 | $81,526.10 | $870,320.76 |

| | | | |
|---|---|---|---|
| Total (per contra) | | | $870,320.76 |
| Deduct: | | | |
| Dividends declared ($253,062.00) on preferred stock, less cancellation ($1,186.50) for quarter ended Dec. 31, 1941, on 483 shares of $6 preferred stock and 264 shares of $7 preferred stock surrendered by parent company | $251,875.50 | | $251,875.50 |
| Appropriation to reserve for depreciation (representing pro forma balance of earned surplus at June 30, 1941*) | 378,664.26 | | 378,664.26 |
| Net increase in earned surplus from June 30, 1941, to October 31, 1941, transferred to capital surplus | 158,254.90 | | 158,254.90 |
| Amount equivalent to dividends on preferred stock applicable to Nov. and Dec., 1941, declared prior to Oct. 31, 1941, transferred to capital surplus | | $41,386.00 | 41,386.00 |
| Total deductions | $788,794.66 | $41,386.00 | $830,180.66 |
| Balance at end of period; balance at December 31, 1941, represents surplus earned since October 31, 1941 (see Note 3 to balance sheet) | | $40,140.10 | $ 40,140.10 |

* Date of the financial statements filed by the Company with the Securities and Exchange Commission in connection with refunding its bonds.

## MISSISSIPPI POWER COMPANY

### Summary of Capital Surplus

For the Year Ended December 31, 1941

| | | |
|---|---|---|
| Balance, December 31, 1940, as per previous report | $ 674,769.01 | |
| Reduction of amount stated as capital with respect to the outstanding 450,000 shares of common stock from $7,836,834.88 to an amount equal to $10.00 per share (an aggregate of $4,500,000.00) | 3,336,834.88 | |
| Amount, arising through cancellation of funded debt, received from parent company, representing the excess of the principal amount of such funded debt over the cost thereof to the parent company, less that portion ($1,753.04) of the excess credited to unamortized debt discount and expense being the unamortized balance at September 30, 1941, in said account with respect to such funded debt | 9,140.71 | |
| Adjustment of federal income tax accruals prior to 1940 | 25,000.00 | |
| Balance of earned surplus at October 31, 1941, transferred hereto | 158,254.90 | |
| Amount transferred from earned surplus subsequent to October 31, 1941, being equivalent to dividends on preferred stock applicable to November and December, 1941, declared prior to October 31, 1941 | 41,386.00 | $4,245,385.50 |

| | | | |
|---|---|---|---|
| Total (per contra) | | | $4,245,385.50 |
| Deduct: | | | |
| Reduction in recorded value of utility plant in accordance with order of the Federal Power Commission issued October 7, 1941, in response to Company's application | | $2,173,772.02 | |
| To increase the preferred stock stated capital of 20,099 shares of $6 preferred stock and 18,246 shares of $7 preferred stock to $100.00 per share, the value on involuntary liquidation | | 377,636.63 | |
| Charge, in connection with the redemption of the First and Refunding Mortgage 5% Gold Bonds outstanding in the hands of the public, representing (1) the unamortized balance ($343,792.22) of debt discount and expense applicable thereto, (2) redemption premium and expenses ($220,107.48) and (3) interest ($102,958.34) from October 31, 1941, to date of call March 1, 1942. | $666,858.04 | | |
| Less — Amount equivalent to the reduction in federal ($153,484.00) and state ($43,056.00) income taxes for the year 1941 resulting from the deductibility of discount, call premium and expense applicable to bonds retired in 1941 (see footnote to statement of income). | 196,540.00 | 470,318.04 | |
| Appropriation to reserve for depreciation (representing net increase in capital surplus account over pro forma balance at June 30, 1941) | | 320,534.97 | 3,342,261.66 |
| Balance, Dec. 31, 1941 (see Note 1 to balance sheet) | | | $ 903,123.84 |

**Book value of capital stock.** The book value of capital stock is the amount that would be paid the shareholders if the corporation liquidated, and if the liquidation took place without any realization gains, losses, or expenses. In most instances, book value is thought of as implying an immediate no-loss liquidation; that is, the calculations are made as of a certain immediate date, usually the last balance sheet date.[58] If there is only one class of stock, the date of the assumed no-loss liquidation is immaterial. However, when there is more than one class of stock, the no-loss liquidation is ordinarily dated to give the maximum book value to the class of stock holding the voting control of the corporation.

The calculation of book value may have several purposes:

1. To determine the types and amounts of securities to be issued in a merger or consolidation. The relative book value is only one factor, however, which is taken into consideration.[59]

[58] (1932) Paton 951.

[59] See an illustrative example in Students' Department, 61 *Journal of Accountancy* 462.

2. To determine minority interests in consolidated statements.[60]
3. To compare the relative investment quality of several different stocks.
4. To furnish some evidence of inherent value in the absence of a fair market value. This has been used in certain cases by the Tax Court of the United States.[61]
5. To furnish a possible basis for certain types of taxes, such as franchise and property.

It is generally assumed that all classes of surplus have the same effect on the book value of stock. If there is only one class of stock, the corporate proprietorship divided by the number of shares outstanding and subscribed gives the book value per share. The corporate proprietorship to be used in this calculation includes all classes of surplus and surplus reserves. The Treasury Stock, Bonus Stock, and Discount on Capital Stock accounts are treated as negative proprietorship items. If more than one class of stock is outstanding, the calculation of the respective book values may become involved. In general, the total proprietorship, minus the proprietorship allocated to the preferred stock, is the total book value pertaining to the common stock; this residual amount divided by the number of common shares outstanding and subscribed gives the book value per share of common stock.

The amount of proprietorship to be allocated to the preferred stock depends upon the details of the preferred stock contract. The principal points involved are as follows:

1. Noncumulative stock is entitled to only the current year's dividend when earned.[62] Some accountants, however, would add the current year's noncumulative dividend to the book value of the preferred only if the management intends to pay it.[63]

2. Cumulative stock should be allocated all dividends in arrears, whether earned or not,[64] especially if the preferred stock is by contract to receive upon liquidation an amount equal to "accrued" dividends. There is, however, some disagreement on this point, as some authorities hold that "the dividends in arrears are not a lien on paid-in surplus," [65] while others insist that the cumulative feature does not become

[60] See an illustrative example in Students' Department, 61 *Journal of Accountancy* 226.
[61] (1943) Paton 466.
[62] *Barclay v. Wabash Railway,* 280 U.S. 197. The court held that "noncumulative stock is only entitled to a dividend if declared out of annual profits . . . if those profits are justifiably applied by the directors to capital improvements, and no dividend is declared within the year, the claim for that year is gone and cannot be asserted at a later date."
[63] (1938) Taylor-Miller 243.
[64] *Pennington v. Commonwealth Hotel Const. Co.,* 151 Atl. 228, 155 Atl. 514; *Fawkes v. Farm Lands Inv. Co.,* 297 Pac. 47; *Page v. Whittenton Mfg. Co.,* 97 N.E. 1006; Sunley, 8 *Certified Public Accountant* 56; Winter, S. G., *C.P.A. Answers and Solutions* (New York: Prentice-Hall, Inc., 1930), p. 500; (1939) Kohler 159; Noble, H. S., Karrenbrock, W. E., and Simons, H., *Advanced Accounting* (Cincinnati: South-Western Publishing Co., 1941), p. 615; Baumann, 61 *Journal of Accountancy* 462; Chamberlain, 16 *Accounting Review* 217.
[65] (1932) Paton 952.

"operative" if the surplus is not sufficient to cover the dividends in arrears.[66] It seems to the present authors that the calculation of book value involves the question of proprietorship allocation rather than the method by which the proprietorship has been accumulated, so the entire amount of the dividends in arrears should be added to the book value of the preferred stock.

3. Preferred stock, which has a premium applicable to it on dissolution, should have this retirement premium added to the book value it would have without this retirement provision;[67] if the retirement premium varies with the passing of time, the amount of the book value would naturally vary with the specific time selected for the calculation.

4. The call premium on preferred stock, if callable at option of the company, is ignored in calculating book value.[68] The reason for this is that book value implies a dissolution of the corporation rather than a voluntary rearranging of the capital structure.

5. Preferred stock is usually held to be participating unless otherwise stipulated.[69] As a matter of practice, however, in nearly every case the extent of the participation is expressly stated on the certificate. Where the right of equal participation exists, enough surplus must be allocated to cover any dividend arrearages on the preferred stock and to give the equivalent of one year's dividend (computed at the preferred stock rate) to the common stock, and the remaining surplus must be allocated on the basis of the total par values [70] or liquidation values [71] of the shares outstanding. If the right of participation does not call for equal participation, the allocation must be made in accord with the specific details of the contract.

6. If some of the shares have a par value and some are no-par, and if both classes are participating, the par value and the assigned value of the shares, respectively, must be allocated to the different classes of stock. The surplus remaining after the allocations for the dividends of prior years and the regular dividends for the current year must be divided among all of the shares, preferred and common, share and share alike.[72]

7. If the non-participating preferred shares have a par value and the common shares have no par value, the total book value of the preferred stock is the sum of its par value, any premium applicable to it on dissolution, and any dividends in arrears; and the aggregate book value of the no-par common shares is the excess of the total proprietorship equity over the equity applicable to the preferred stock.[73]

8. In case of preferred stock without par value, the amount which the preferred is to receive as a prior claim in the event of involuntary liquidation, or, in the absence of such a figure, the amount paid in [74] should be allocated to the preferred stock in lieu of the amount ordinarily assigned as par value.

[66] (1942) Fjeld-Sherritt 171; Baumann, 62 *Journal of Accountancy* 302; (1947) Johnson 476.

[67] Proposition for Month Section, 18 *American Accountant* 347; (1932) Streightoff 136; (1937) Montgomery 565.

[68] (1943) Paton 466; (1942) Fjeld-Sherritt 180; (1947) Johnson 475–476; (1947) Langer, Lecture 2, p. 7.

[69] *Englanders v. Osborne*, 261 Pa. 366; *Sternbergh v. Brock*, 24 L.R.A. (N.S.) 1078; *Fidelity Trust Co. v. Lehigh Valley R. Co.*, 64 Atl. 829; *Niles v. Ludlow Value Mfg. Co.*, 202 Fed. 141. But to the contrary see *Scott v. B. & O. Ry. Co.*, 49 Atl. 327.

[70] (1942) Fjeld-Sherritt 176; (1938) Taylor-Miller 240–241; (1937) Montgomery 565.

[71] (1938) Paton 675.

[72] (1942) Fjeld-Sherritt 176.

[73] Proposition for Month Section, 18 *American Accountant* 347; (1931) Taylor-Miller 149.

[74] (1938) Paton 675.

After the preceding discussion the following points should be kept in mind in deriving book values:

a. Book values are only as accurate as the figures on the balance sheet are accurate. This limitation should be observed at all times.

b. Book values imply a no-loss liquidation, whereas in practice most liquidations result in sizable gains or losses.

c. Wherever more than one class of stock is outstanding, some degree of arbitrariness enters into the calculations.

d. In cases where several issues of different types of shares are outstanding, a definite allocation "may be more misleading than helpful, and in this event a brief statement of the principal rights and relationships involved should be employed in lieu of assignment where the question of book value is raised." [75]

e. In some instances only the "tangible" proprietorship is considered in deriving the book value; that is, all intangible assets are first offset against earned or other surplus on the grounds that these intangibles will yield little in a liquidation. This is a variation which has doubtful merit, but is sometimes employed in statement analysis.

[75] (1938) Paton 675.

# *CHAPTER 5*

## Non-Surplus Reserves

**Reserves — introductory.** The term "reserve" has several different uses in accounting. Moreover, a casual examination of a group of balance sheets will indicate that "reserve accounting" is not yet standardized, and that accountants sometimes use the title "reserve" rather indiscriminately. This conclusion is supported by a rapid survey of the following titles taken from actual balance sheets:

1. Reserve for Federal Income Taxes
2. Reserve for Restoration of Leased Property at End of Lease
3. Reserve for Premium on Future Bond Redemption
4. Reserve for Future Pensions to Employees
5. Reserve for Inventory Fluctuations
6. Reserve for Intercompany Profits in Inventories
7. Reserve for Reappraisal of Fixed Assets
8. Reserve for Undeclared Dividends
9. Reserve for Doubtful Accounts
10. Reserve for Foreign Exchange Fluctuations
11. Reserve for Depletion
12. Reserve for Discounts on Sales
13. Reserve for Self-Insurance — Fire and Liability
14. Reserve for Social Security Taxes
15. Reserve for Plant Extension
16. Reserve for Subscriptions Received but not Earned
17. Reserve for Repairs
18. Reserve for Retirement of Fixed Assets
19. Reserve for Future Decline in Inventory Prices
20. Reserve for Treasury Stock Purchased
21. Reserve for Purchase Commitments
22. Reserve for Contingencies
23. Reserve for Shrinkage in Inventory Values
24. Reserve for Equalization of Dividends
25. Reserve for Pending Patent Litigation
26. Reserve for Post-war Readjustments
27 Reserve for Renegotiation of War Contracts
28. Reserve for Equalization of Overhead Rates
29. Reserve for Decline in Value of Temporary Investments
30. Reserve for Unrealized Profit on Installment Sales
31. Reserve for Depreciation
32. Reserve for Amortization of Leasehold
33. Reserve for Unamortized Discount on Bonds Held as Investments
34. Reserve for Bond Sinking Fund
35. Reserve for Prepaid Leasehold
36. Reserve for Bad Debts

37. Reserve for Future Sales Discounts
38. Reserve for Anticipated Cash Sales Discounts
39. Reserve for Plant Maintenance
40. Reserve for Manufacturing Contingencies
41. Reserve for Contingencies Arising Out of the War
42. Special Reserve for War Contingencies
43. Reserve for Contingencies Arising from Government Orders
44. Reserve for Postwar Contingencies
45. Reserve for Postwar Abnormal Expenses
46. Reserve for Additional Costs Arising Out of the War
47. Reserve for Postwar Rehabilitation of Plant
48. Reserve for Postwar Plant Reconversion
49. Reserve for Postwar Adjustments of Merchandise Values
50. Reserve for Shrinkage and Possible Abnormal Obsolescence of Inventories
51. Reserve for Cessation of War Business
52. Special Reserve
53. Reserve for Postwar Repairs and Decline in Prices
54. Reserve for Maintenance that has not been Performed because of Inability to take the Equipment out of Service
55. Reserve for Deferred Maintenance
56. Reserve for Separation Allowances
57. Reserve for Merit Rating Losses — State Unemployment Insurance
58. Reserve for Loss on Commitments due to the Cessation of Manufacturing
59. Reserve for Inventory Overhead Increase
60. Reserve for Taxes and Other Contingencies
61. Reserve for Deferred Repairs and Maintenance
62. Reserve for Contingencies including Possible Tax and Other Adjustments
63. Reserve for Possible Reductions in Inventory Values
64. Reserve for a "Rainy Day"
65. Reserve for Obsolescence
66. Reserve for Shortages in Inventories
67. Reserve for Cotton Futures
68. Reserve for Interest on Investment
69. Reserve for Accidents
70. Reserve for Experimental Work
71. Reserve for Capital Expenditures
72. Reserve for Collection Expense
73. Reserve for Expansion
74. Reserve for Losses in Closed Banks
75. Reserve for Working Capital
76. Reserve for Retirement of Bonds
77. Reserve for Redemption of Preferred Stock
78. Reserve for Unclaimed Wages
79. Reserve for Interdepartmental Profit in Inventory
80. Reserve for Encumbrances

It is obvious from the titles given that the nature and significance of many of these reserves cannot possibly be determined without extensive knowledge of the facts and opinions giving rise to the reserve. In addition, several of the reserves listed are undoubtedly "hybrids"; i.e., under any

classification scheme employed the title could possibly be included in more than one class. All this makes the interpretation of the reserve more difficult.

In order to assist in clearing up some of the confusion which exists in reserve accounting, it has been suggested that other terms be substituted for the word "reserve," such as "provision for," or "allowance for." While this would avoid some of the ambiguity now present in the problem, it hardly gets to the fundamentals. Rather, what is needed is a more careful examination of the purposes to be accomplished by the reserves and more descriptive terms employed in indicating how the purposes are fulfilled.

The Committee on Terminology of the American Institute of Accountants has recently made some very significant recommendations concerning the possible abandonment of the expression "reserve" in accounting statements except in one sense.[1] The complete report follows:

The term *reserve* is used in accounting in a variety of different and somewhat conflicting senses. As a result clarity of thought and accuracy of expression are impaired and an adequate understanding of financial statements on the part of users is made more difficult than is necessary. In addition the variations in balance sheet classification and presentation of the so-called reserves contribute to the confusion and make comparisons difficult. It is suggested that the current uses of the term may be reviewed and that recommendations may be made as to acceptable definition and to limitations on usage which will serve to make the financial statements more readily understood.

In dealing with financial matters the term *reserve* is commonly used to describe specific assets which are held or retained for a specific purpose. This is the sense in which the term is employed, for instance, in our banking system, which derives its name from the fact that member banks are required to maintain deposits with the central or *reserve* banks. The term is also used to indicate such assets as oil and gas properties which are held for future development. These usages present no problem in accounting where the assets in question are described according to their nature or referred to as *funds* or *deposits* for specific purposes.

In current accounting practice the term *reserve* is used in four senses, as follows:

1. The term is used to describe (a) a deduction which is made from the face amount of an asset in order to arrive at the amount which it is expected will be realized, as in the case of a reserve for uncollectible accounts, or (b) a deduction which is made from the cost or carrying value of an asset, representing the portion of the cost which has been amortized or allocated to income, in order to arrive at the amount properly chargeable to future operations, as in the case of a reserve for depreciation. In this sense reserves are customarily referred to as valuation reserves, and are usually deducted in the *asset* section of the balance sheet.

2. The term is used to indicate (a) an estimate of an admitted liability of uncertain amount, as in the case of a reserve for damages, (b) an approximation of the probable amount of a disputed claim, as in the case of a reserve for additional taxes, or (c) an estimate of a liability or loss which is sufficiently likely to occur to require recognition, as in the case of a reserve for self-insurance. These reserves are included in the *liability* section of the balance sheet, in a section immediately below the ordi-

[1] *Accounting Research Bulletin No. 34* (quoted by permission).

nary liabilities, or in the *proprietary* section. In the insurance field the term is used in this sense as referring to the portion of the total assets derived from premiums which is required to meet future payments under policies.

3. The term is sometimes used, although not in accordance with the best practice as generally recognized, to indicate a variety of charges set forth in the income statement, including estimated losses as a result of uncollectible accounts and other causes, depreciation, depletion, amortization, probable losses, specific contingencies, and similar items. It is to be noted here that the term refers to the charge by means of which a reserve (in the credit sense) is created.

4. The term is used to indicate that an undivided or unidentified portion of the net assets, in stated amount, is being held or retained for a special purpose, as in the case of a reserve (a) for betterments or plant extensions, or (b) for excess cost of replacement of property, or (c) for possible future inventory losses, or (d) for general contingencies. In this sense a reserve is frequently referred to as an appropriation of retained earnings.

The dictionaries define the term *reserve* generally and in substance in its etymological sense, as something held or retained for a purpose, frequently for emergencies. It is apparent therefore that the broad usage referred to, in the second paragraph of this memorandum, is one which clearly reflects the general understanding of the term, i.e., specific assets held or retained for some purpose. It is also apparent, however, that the occasions for usage in this sense are distinctly limited, and that where specified assets are segregated and held for some purpose they may be described for accounting purposes by the use of such terms as *fund, deposit, temporary investments,* etc. While the general characterization of these items as reserves is acceptable usage, it is not involved in the problem of definition within the field of accounting.

The first accounting usage of the term set forth above seems clearly contrary to the commonly accepted meaning of the term. A so-called reserve for bad debts or for depreciation does not in itself involve a retention or holding of assets, identified or otherwise, for any purpose. Its function is rather to indicate a diminution or decrease in an asset due to a specified cause; the use of the so-called reserve in this area is essentially a part of a process of measurement. In the recent amendment of the British Companies Act the British accountants appear to have been troubled by the various uses of the term *reserve* and as a result of their recommendations it is now provided that the so-called reserve of this type shall be described as a *provision.* It may well be doubted whether this is an improvement, because any provision must of necessity and in the final analysis be made by the allocation or segregation of assets. While it seems clearly advisable to drop the term *reserve* in this area, it should be replaced by terms which indicate the measurement process, i.e., such terms as "less estimated uncollectibles," "less estimated losses in collection," "less amortization to date," etc.

The second of the four accounting usages set forth above is also contrary to the generally accepted meaning of the term. It may be argued, of course, that the statement of any liability in the balance sheet is an indication that a portion of the assets will be required for its discharge. In this sense the statement may be regarded as a provision or reserve. It is clearly preferable, however, to regard the statement as indicating the obligation itself which is a deduction necessary to arrive at proprietary investment or net assets. The items in this area described as reserves might better be designated in some such way as "estimated liabilities" or "liabilities of estimated amount."

The third of the four usages set forth above involves different considerations since it is a matter of the income statement rather than the balance sheet. In a sense a charge of this nature in the income statement, e.g., a charge for depreciation, is a "reserve" in so far as it indicates that cash or other assets received by way of revenues is, to the extent indicated, to be used or devoted to a special purpose. It seems clear, however, that the basic purpose in the making of these charges is one of income measurement and that the designation of such charges as costs, expenses or losses, i.e., elements in the measurement of income, is clearly more understandable than the designation of *reserves*. The description of these charges as *reserves* or *provisions* suggests not only that the function of depreciation accounting is one of replacement, but in addition leads to the suggestion that the provision be based upon estimated future cost. It seems desirable accordingly that the use of the term *reserve* in the income statement be discontinued.

The generally accepted meaning of the term *reserve* corresponds fairly closely to the last of the four usages set forth above, i.e., the indication of an amount of unidentified or unsegregated assets held or retained for a specific purpose. While retention of assets for a variety of purposes is an important phase of corporate management and finance, the retention does not ordinarily involve a segregation. It is suggested that this meaning may be well adopted as the primary significance of the term in accounting and that other uses of the term be discontinued. It is interesting to note that in the 1947 revision of the British Companies Act, the British accountants succeeded in securing a limitation of the term to this area.

To summarize, it is recommended that the use of the term *reserve* in accounting be limited to the last of the four senses set forth above, i.e., to indicate that an undivided portion of the assets is being held or retained for general or specific purposes, and that the use of the term in the balance sheet, in describing deductions from assets or provisions for particular liabilities and in the income statement be discontinued.

In this chapter, the fourfold classification scheme noted in the quotation above is expanded in order to develop the journalization rules used in maintaining the reserves and to set out more clearly than has been done heretofore the lines of demarcation tending to separate one type of reserve from another. To carry this out, reserves are discussed in succeeding sections under the following classes:

1. Pure Budgetary (or operating)
2. Pure Valuation (or offset)
3. Budgetary — Valuation
4. Valuation — Budgetary
5. Valuation — Accrual
6. Liability — Accrual
7. Budgetary — Liability
8. Unrealized Surplus
9. Appropriated Earned Surplus Reserves:
   a. For possible losses
   b. For other purposes

**Pure budgetary reserves.** Reserves of this class are used for two principal purposes: (1) To provide for budgetary control of expenditures and

charges of a certain type, and (2) to provide a method of spreading out uniformly a cost or expense item over successive days, weeks, or months in spite of the fact that the items are actually incurred at irregular intervals during the fiscal year. Because of the latter purpose, these reserves are often called "operating" reserves. Expressed differently, the purpose is essentially one of equalizing the charge (to interim profit and loss statements) for items which may be discovered or paid out in fairly large amounts at infrequent intervals. An enterprise, for example, may have sizable amounts of shrinkage or petty theft of raw material. The cost factor involved may be discovered only at irregular times when the materials are physically counted. In order to spread this charge over the product completed in each interim period, the estimated amount for an entire fiscal year will be budgeted and a prorata portion debited to factory costs each week, month, etc., the budgetary reserve being credited. Then, as the shortages are discovered, the reserve will be debited and Material account credited for the cost of the material lost. Numerous other situations similar to this could be cited which might occasion the use of a pure budgetary reserve; some of these are discussed below.

At the end of the fiscal year, pure budgetary reserves have no balances, since any remaining amount appearing in the reserve at that time is transferred to Cost of Goods Sold, or prorated between Cost of Goods Sold and the inventories, or the related expense account if the budgeted items are selling or administrative outlays. On balance sheets prepared during a fiscal year, they would appear among the Deferred Charges if their balances are debited or among the Deferred Credits if their balances are credited.

Pure budgetary reserves are credited at the start of a period with a prorata portion of the estimated losses or costs specified in the budget, and are debited with the actual losses or costs as ascertained during the fiscal period. Typical reserves of this class are described in detail below.

*Reserve for Shortage in Materials and Supplies account.* This reserve maintains budgetary control over the extra cost factor involved in overissue and petty theft of materials and supplies. The debits and credits are:

DEBITS

1. Amount of discrepancies found when the perpetual and physical inventories of materials and supplies are compared; the credit is to Materials and Supplies account.
2. Closing adjustment; if the annual budgetary allowance is excessive, the ordinary credit is to Cost of Goods Sold.

CREDITS

1. Budgetary estimate of the cost or expense due to overissue or petty theft of materials and supplies; the debit is to Burden Incurred. This entry is ordinarily made on a monthly basis, or some other reasonable allocation scheme.

2. Closing adjustment, if the annual budgetary allowance is insufficient; the debit is ordinarily made to Cost of Goods Sold.

*Reserve for Shortage and Damage in Work in Process account.* This reserve maintains budgetary control over the wastage and spoilage occurring during the manufacturing processes (overages are handled in an opposite fashion). The debits and credits are:

DEBITS

1. Amount of loss due to defective processed materials; the credit is to the Materials to Be Salvaged account (or to the Work in Process account).
2. Amount of discrepancies found when the perpetual and physical inventories of work in process are compared; the credit is to the Work in Process account.
3. Closing adjustment, if the annual budgetary allowance is excessive; the credit is ordinarily made to Cost of Goods Sold.

CREDITS

1. Budgetary estimate of the cost or expense due to wastage and spoilage occurring during factory operations; the debit is to Burden Incurred account. This entry is ordinarily made on a monthly basis, or some other reasonable allocation scheme.
2. Closing adjustment, if the annual budgetary allowance is insufficient; the debit is ordinarily made to Cost of Goods Sold.

Other examples of this class of reserves are:

a. Reserve for Experimental Work (if budgeted for an annual period)
b. Reserve for Burden Under- or Over-Applied (if burden is budgeted for an annual period). This account is often simply called "Burden Under- or Over-Applied."
c. Reserve for Under- or Over-Applied Distribution Costs [serves the same purpose for distribution costs as (b) reserve above does for factory burden]

**Pure valuation reserves.** When the book balance of an account does not correspond to the correct amount which should be in the account, and when it is cumbersome to adjust directly the book amount, the suspended adjustment may be recorded in a pure valuation reserve. This type of reserve is ordinarily used only when a balance sheet is about to be prepared, and therefore is inactive during the accounting period.

After being adjusted to the correct amount, pure valuation reserves are deducted from their related accounts on the balance sheet. An exception occurs, however, when one of these reserves — the Reserve for Cotton Futures — has a debit balance (price of cotton has increased since cotton futures were sold). The Bureau of Internal Revenue allows cotton futures to be valued at market, so if the market price has advanced, the debit balance of the reserve may be added to the cost price of the futures. (It is preferable, however, to list the cotton futures at market and not state the reserve separately, since reserves with debit balances are misleading to some lay readers of statements.)

Pure valuation reserves are at the date of the balance sheet debited or credited with the amounts needed to adjust their balances to the correct figures.

*Reserve for Inventory Decline.* This reserve is a valuation item, which, when deducted from the inventories on the balance sheet, reduces the inventories from cost to market price (situations in which the market is more than cost are ignored). The debit and credit are:

DEBIT

1. The amount, if any, necessary to reduce the balance of the reserve until it exactly equals the present excess of cost price over the market price of the inventories; the credit is to the Loss or Gain on Inventory Fluctuation account.

CREDIT

1. The amount, if any, necessary to increase the balance of the reserve until it exactly equals the present excess of the cost price over market price of the inventory; the debit is to Loss or Gain on Inventory Fluctuation account.

The Reserve for Inventory Decline has been the subject of extended analysis by the Committee on Accounting Procedure of the American Institute of Accountants.[2] Its report follows:

1. Reserves designed to set aside a part of current profits to absorb losses feared or anticipated in respect to inventories on hand, or in connection with future purchases, are the subject of this bulletin. Charges to provide, either directly or by use of a reserve, for obsolescence, deterioration, or similar losses, or for reducing an inventory to market, or for reducing an inventory to a recognized basis such as last-in first-out or its equivalent in accordance with an announced change in policy to be consistently followed thereafter, are regarded as proper charges to income, and are not under consideration in this bulletin. The committee has already dealt with reserves arising out of the war (Bulletins Nos. 13 and 26), and with general purpose contingency reserves (Bulletin No. 28).

2. The committee has previously (Bulletin No. 8) recognized the character of the income statement as a tentative installment in the long-time financial results, and is aware of the tendency to exaggerate the significance of the net income for a single year. Nevertheless, there still exists the responsibility for determining net income as fairly as possible by sound methods consistently applied, and the duty to show it clearly.

3. In accomplishing this objective, it has been deemed desirable to provide, by charges in the current income statement, properly classified, for all foreseeable costs and losses applicable against current revenues, to the extent that they can be measured and allocated to fiscal periods with reasonable approximation (Bulletin No. 13). In applying this rule, inventories on hand or contracted for should be priced in accordance with principles recently stated by the committee (Bulletin No. 29). When such an inventory which has been priced in accordance with those principles is further written down by a charge to income, either directly or through the use of a reserve, current costs are not properly matched with applicable revenues and future charges are correspondingly reduced. This process may result in the shifting

[2] *Accounting Research Bulletin No. 31* (quoted by permission).

of profits from one period to another without accounting justification. The committee is on record that reserves should not be created for the purpose of equalizing reported income (Bulletin No. 13).

4. It has been argued that losses which will have to be taken in periods of receding price levels have their origins in periods of rising prices, and that, therefore, reserves to provide for future price declines should be created in periods of rising prices by charges against the operations of those periods. Computations of reserves of this kind have to be made on the basis of assumptions as to what future price levels will be, what quantities will be on hand if and when a major price decline takes place, and finally, whether loss to the business will be measured by the amount of the decline in prices. The bases for such assumptions are so uncertain that any conclusions drawn from them would generally seem to be speculative guesses rather than informed judgments. When estimates of this character are charged to current costs, amounts representing mere conjecture are combined with others determined with a reasonable degree of accuracy (Bulletin No. 13).

5. The committee is therefore of the opinion that inventory reserves, such as those created:

a. for possible future inventory losses on inventories not on hand or contracted for, or

b. without regard to any specific loss reasonably related to the operations of the current period, or

c. for the purpose of reducing inventories other than to a basis which is in accordance with generally accepted accounting principles (Bulletin No. 29) are of such a nature that charges or credits relating to such reserves should not enter into the determination of net income and that they should not be used to relieve the income account of any year.

6. The committee is also of the opinion that if a reserve of the type described in paragraph 5 is set up: (1) it should be created preferably by a segregation or appropriation of surplus, (2) no costs or losses should be charged to it and no part of it should be transferred to income or in any way used to affect the determination of net income for any year, and (3) the reserve should be restored to surplus when it is no longer considered necessary. The committee recognizes as proper, though less desirable, the alternative procedure of (a) setting up such a reserve by an appropriation of net income so reported in the income statement that the final figure would clearly indicate that it is not the entire net income, and (b) of showing the subsequent return of such a reserve at the foot of the income statement after the determination of net income for the period in such a way as to clearly indicate that it is not income.

After several months of further study the Committee made its views more positive in *Accounting Research Bulletin No. 35* (quoted by permission):

1. In *Accounting Research Bulletins Nos. 28, 31, 32,* and *33,* two alternative methods of displaying items excluded from the determination of net income are indicated as being acceptable. Under the first of these methods, the excluded items are displayed in the surplus statement; under the second they are shown in the income statement after the amount designated as net income. Since the issuance of those bulletins, charges and credits displayed in accordance with the second method have been included in many income statements in a manner and with word-

ing which has occasioned misconceptions as to whether the earnings for the period were the amounts captioned as net income or were the final and more prominent amounts shown on the income statements after the deduction or addition of such charges and credits.

2. The committee believes the possibility of misconception in this respect will be minimized by the adoption of the first method in all cases. Accordingly it recommends that the net income for the period be shown henceforth without deductions or additions of items which are properly excluded from the determination of net income. These items consist primarily of charges and credits with respect to (a) general purpose contingency reserves, discussed in *Accounting Research Bulletin No. 28*, (b) inventory reserves, discussed in *Accounting Research Bulletin No. 31*, (c) extraordinary items, which, if included, would impair the significance of net income, discussed in *Accounting Research Bulletin No. 32*, and (d) excessive costs of fixed assets and annual appropriations in contemplation of replacement of productive facilities at higher price levels, discussed in *Accounting Research Bulletin No. 33*.

3. The committee's recommendation is not intended to preclude or discourage the use of the combined statement of income and earned surplus recommended in *Accounting Research Bulletin No. 8*, provided the figure of net income is followed immediately by the surplus balance at the beginning of the period; nor is it intended to preclude the use of a separate statement showing the disposition of net income, if practicable. The committee is also of the opinion that deduction of the single item of dividends from net income on the income statement would not be subject to misconception.[3]

*Reserve for Cotton Futures.* This reserve (credit balance assumed) is a valuation item, which, when combined with the Cotton Futures asset account on the balance sheet of a cotton mill, adjusts the valuation of the contracts for future delivery of cotton from the cost to the market price. The debit and credit are:

DEBIT

1. The amount, if any, necessary to reduce the balance of the reserve until it exactly equals the present excess of the cost price over the market price of the cotton future contracts; the credit is to Cost of Cotton Consumed account.

CREDIT

1. The amount, if any, necessary to increase the balance of the reserve until it equals exactly the present excess of the cost price over the market price of the cotton future contracts; the debit is to the Cost of Cotton Consumed account.

Many firms, in addition to those hedging on cotton, could also use a futures reserve account, such as those processing wheat, rye, oats, etc.

Other examples of this class of reserves are:

a. Reserve for Fluctuation in Price of Temporary Investments
b. Reserve for Fluctuation in Foreign Exchange (on receivables and inventories)

[3] For further discussion see Soper, 23 *Accounting Review* 391–396.

**Budgetary-valuation reserves.** The budgetary-valuation reserves are hybrid in character. They come closer to fulfilling the function of a pure budgetary reserve than they do a pure valuation reserve. These reserves, therefore, follow the rule for journalization of the budgetary reserves during the fiscal period, but revert to the rule for the valuation reserves at the end of the period. That is, budgetary-valuation reserves are debited with actual (or total booked) losses, expenses, or costs, and credited with estimated amounts during the fiscal period. At the end of the fiscal period, they are adjusted to show the appropriate valuations of their related asset accounts. They are also deducted from their related accounts when balance sheets are prepared. Some typical examples are given below.

*Reserve for Doubtful Accounts.* The debits during a fiscal period to the Reserve for Doubtful Accounts are made in the same manner and in accord with the rule for budgetary reserves (i.e., debits cover actual losses ascertained and written off during the fiscal period). The credits for estimated losses may be made during the period based on a percentage of credit sales (the budgetary procedure) or may be made at the end of the period based on an analysis of the notes and accounts receivable (the valuation procedure). Of course, if the budgetary procedure is followed as to credits, the valuation adjustment must be made when the balance sheet is prepared. The debits and credits are:

DEBITS

1. The amount of notes and accounts receivable written off the books as worthless; the credits are to the Accounts Receivable and Notes Receivable accounts.
2. The amount, if any, necessary to reduce the balance of the reserve until it exactly equals the expected loss from bad debts among the accounts and notes receivable on the balance sheet.

CREDITS

1. The estimated bad debt losses resulting from current credit sales; the debit is to the Bad Debts Expense Estimated account.
2. Collection of accounts receivable or notes receivable previously written off as uncollectible during the current accounting period; the debit is to Cash account.
3. The amount, if any, necessary to increase the balance of the reserve until it exactly equals the expected loss from bad debts among the accounts and notes receivable on the balance sheet.

*Reserve for Depreciation.* The budgetary nature of the Reserve for Depreciation calls for credits for the amortization of the net book value of the asset chargeable to the current period and for debits for the total booked amortization at date of selling or scrapping of the asset. Errors in estimation are not shown in this reserve except when an appraisal has been made (see discussion in last part of Chapter 10). Ordinarily, errors in estimates found at date of disposing of the asset are recorded in the Loss and Gain on Sale of Fixed Assets account. The debits and credits are:

DEBITS

1. Total recorded depreciation booked up to date of the disposal of the fixed asset; the credit is to the account for the related fixed asset.
2. Amount, if any, necessary to reduce the balance of the reserve until it exactly equals the correct total of amortized book value of the related asset as per a formal appraisal; the credit is to Excess Recorded Depreciation account (see discussion in last part of Chapter 10).

CREDITS

1. The estimated depreciation chargeable to the current period; the debit is to the Depreciation Expense (or Cost) account.
2. Amount, if any, necessary to increase the balance of the reserve until it exactly equals the correct total of amortized book value of the related asset as per a formal appraisal; the debit is to the Unrecorded Depreciation account (see discussion in last part of Chapter 10).

*Reserve for Predictable Obsolescence.* This reserve records predictable obsolescence in the same way that the Reserve for Depreciation records depreciation. A distinction should be made, however, between predictable and unpredictable obsolescence; the latter is recorded (if at all) in an appropriated earned surplus reserve (see discussion below). In the past, predictable obsolescence has often been merged with the depreciation estimate. If a special Reserve for Predictable Obsolescence is used, the debits and credits are:

DEBITS

1. Total recorded predictable obsolescence booked up to the date the fixed asset is disposed of; the credit is to the account for the related fixed asset.
2. Amount, if any, necessary to reduce the balance of the reserve until it exactly equals the total devaluation due to predictable obsolescence up to the date of a formal appraisal; the credit is to Excess Recorded Obsolescence account which in turn is closed to Profit and Loss account.

CREDITS

1. The estimated predictable obsolescence chargeable to the current period; the debit is to the Predictable Obsolescence Expense (or Cost) account.
2. Amount, if any, necessary to increase the balance of the reserve until it exactly equals the total devaluation due to predictable obsolescence up to the date of an appraisal; the debit is to the Unrecorded Obsolescence account which in turn is closed to Profit and Loss account.

Other examples of this class of reserve are:

a. Reserve for Depletion
b. Reserve for Amortization of Emergency Facilities

**Valuation-budgetary reserves.** These reserves are primarily used for the purpose of preventing the inclusion of debatable cost elements (among the

costs of acquiring an inventory) from causing an anticipation of profits in the annual income statement. These inventory reserves are credited at the time the debatable cost element is charged against the inventory and debited at the close of the accounting period with the amount needed to reduce the balance to equal exactly the anticipated profit in the final inventory. When balance sheets are prepared, this class of reserve is deducted from the inventory asset.

*Reserve for Unrealized Profit in Branch Inventory.* The purpose of this reserve is to prevent the practice of billing goods shipped to a branch at higher than cost prices from raising the final stated cost of the inventories on a consolidated or combined statement basis. The debit and credit are:

DEBIT

1. The amount necessary to reduce the balance of the reserve until it exactly equals the unrealized profit in the inventories of the branches; the credit is to Branch Profit and Loss account.

CREDIT

1. The amounts the billed prices exceed the cost prices of interbranch shipments of merchandise; the debits are to the current accounts of the branches.

The Reserve for Unrealized Profit in Branch Inventory is the simplest of the valuation-budgetary reserves to operate because the home office maintains a record of the percentage of markup on the merchandise it ships to the branch. These shipments are recorded by the home office at date of transfer as follows:

| | | |
|---|---|---|
| Branch Current | $25,000 | |
| Shipments to Branch | | $20,000 |
| Reserve for Unrealized Profit in Branch Inventory | | 5,000 |
| To record shipment of merchandise at 125 per cent of cost. | | |

If the branch sold 70 per cent of this merchandise for $22,000, the post-closing trial balance would be:

| | | | |
|---|---|---|---|
| Cash | $22,000 | Home Office Current | $25,000 |
| Inventory | 7,500 | Profit and Loss | 4,500 |
| | $29,500 | | $29,500 |

Upon the receipt of this information, the home office would make the following entry in regard to the unrealized profit:

| | | |
|---|---|---|
| Reserve for Unrealized Profit in Branch Inventory | $3,500 | |
| Branch Profit and Loss | | $3,500 |
| To reduce the reserve to amount of anticipated interbranch profits in the final inventory of the branch; reserve is reduced by [$5,000 − $7,500 − ($7,500 ÷ 1.25)] or $3,500. | | |

The combined profit and loss would then show a profit of $8,000, of which $4,500 is on the branch's books and $3,500 on the home office's books. This agrees with the results that would have occurred if the shipment to the branch had been made at cost, for then the branch's books would have shown a profit of $22,000 − (.7 × $20,000) or $8,000.

The balance of the Reserve for Unrealized Profit in Branch Inventory should be deducted from the inventories on the balance sheet.

*Reserve for Interdepartmental Profit in Inventories.* The purpose of this reserve is to prevent the practice of billing goods in process from one department to another and finished products from the factory to the stockroom at higher than cost prices from causing an anticipation of profits. Strongly departmentalized continuous process firms, such as meat packing or oil refining plants, may have an available market for their product at several stages of the process. In order to determine better whether or not to process the product further and to enable each department to show a rough approximation of the profit which it earns for the entire concern, the internal transfers may be billed at the market price of the units transferred. In such cases, the Reserve for Interdepartmental Profit in Inventories will have the following entries:

DEBIT

1. The amount necessary to reduce the balance of the reserve until it exactly equals the unrealized profit in the final inventories of work in process and finished goods; the credit is to Cost of Goods Sold account.

CREDIT

1. The amounts the billed prices exceed the cost prices of interdepartmental transfers; the debit is to the inventory account for the department or stockroom receiving the transferred units.

The balance of the Reserve for Interdepartmental Profit in Inventories account is deducted from the inventories on the balance sheets. The only complexity in operating the reserve is the determination of the final balance. Originally the amount of interdepartmental profit in the final inventories was computed by use of schedules.[4] Later it was recommended that problems be worked twice, first with the transfers being made at cost and second with the transfers being made at a profit, with the final balance of the reserve determined as the excess of the inventories on the second work sheet over those on the first work sheet.[5] Recently another method of computing the amount of the interdepartmental profit in the final inventories has been proposed which greatly reduces the work involved because it utilizes the ordinary schedules used under process costs for the

[4] Finney, 37 *Journal of Accountancy* 56–57; (1939) Newlove-Smith-White 407.
[5] (1939) Newlove-Smith-White 406–407; (1949) Newlove-Garner 503–506.

various inventories.[6] This procedure may be divided into the following steps:

1. Compute the equivalent production for each cost element using the ordinary process costs method.
2. Set up the ordinary process costs inventory schedules for the costs when departmental transfers are made at cost; there must be a schedule for each cost element having an individual equivalent production.
3. Insert two additional columns for the statistics when departmental transfers are recorded at prices in excess of cost prices.
4. Compute the valuation of the final inventories and units transferred for each set of columns using ordinary process cost methods; unit costs for the valuation of the final inventories should be computed on the New Production line if the first-in, first-out principle is being used, or on the Total (sum of initial inventory and new production) line if the average cost principle is being used.
5. Increase the reserve for the excess of the recorded values over the actual costs for all interdepartmental transfers.
6. Reduce the reserve for the excess of the recorded values over the actual costs for all goods sold to outsiders.
7. Verify that the final balance of the reserve equals the excess of the recorded values over the actual costs for all of the final inventories.

### *Illustrative Problem*

Give the factory ledger journal entries for the first fiscal year of a concern having the following outlays exclusive of departmental transfers:

| | Dept. No. 1 | Dept. No. 2 |
|---|---|---|
| Raw Material | $48,000 | $ 6,000 |
| Direct Labor | 32,000 | 38,000 |
| Burden | 20,000 | 37,000 |

Dept. No. 1 had 10,000 units of product half-completed as to all three cost elements, and had shipped 15,000 units direct to customers and 30,000 units to Dept. No. 2 at $5 per unit. Dept. No. 2 had 10,000 units of product, fully completed as to materials (including transfers from Dept. No. 1), but half-completed as to conversion costs, and had delivered 18,000 units direct to customers and 2,000 units to stockroom at $15 per unit.

### *Solution*

**Calculation of Equivalent Production**

| | Dept. No. 1 | Dept. No. 2 | | |
|---|---|---|---|---|
| | All Elements | Prior Dept. Costs | Materials | Conversion Costs |
| Transferred out | 45,000 | 20,000 | 20,000 | 20,000 |
| Final inventory (weighted by percentage of completion) | 5,000 | 10,000 | 10,000 | 5,000 |
| Equivalent production | 50,000 | 30,000 | 30,000 | 25,000 |

[6] Broom, 23 *Accounting Review* 417.

## Operating Statistics

| Dept. No. 1 | | Actual Costs | | Recorded Values | |
|---|---|---|---|---|---|
| *All Elements* | Units* | Rate | Total | Rate | Total |
| New production | 50,000 | $2.00 | $100,000 | $2.00 | $100,000 |
| Final inventory | 5,000 | 2.00 | 10,000 | 2.00 | 10,000 |
| Transferred out | 45,000 | 2.00 | $ 90,000 | 2.00 | $ 90,000 |
| Sold | 15,000 | 2.00 | 30,000 | 2.00 | 30,000 |
| To Dept. No. 2 | 30,000 | 2.00 | $ 60,000 | 2.00 | $ 60,000 |
| **Dept. No. 2** | | | | | |
| *Prior Dept. Costs* | | | | | |
| New production | 30,000 | $2.00 | $ 60,000 | $5.00 | $150,000 |
| Final inventory | 10,000 | 2.00 | 20,000 | 5.00 | 50,000 |
| Transferred out | 20,000 | 2.00 | $ 40,000 | 5.00 | $100,000 |
| Sold | 18,000 | 2.00 | 36,000 | 5.00 | 90,000 |
| To stockroom | 2,000 | 2.00 | $ 4,000 | 5.00 | $ 10,000 |
| *Materials* | | | | | |
| New production | 30,000 | $ .20 | $ 6,000 | $ .20 | $ 6,000 |
| Final inventory | 10,000 | .20 | 2,000 | .20 | 2,000 |
| Transferred out | 20,000 | .20 | $ 4,000 | .20 | $ 4,000 |
| Sold | 18,000 | .20 | 3,600 | .20 | 3,600 |
| To stockroom | 2,000 | .20 | $ 400 | .20 | $ 400 |
| *Conversion Costs* | | | | | |
| New production | 25,000 | $3.00 | $ 75,000 | $3.00 | $ 75,000 |
| Final inventory | 5,000 | 3.00 | 15,000 | 3.00 | 15,000 |
| Transferred out | 20,000 | 3.00 | $ 60,000 | 3.00 | $ 60,000 |
| Sold | 18,000 | 3.00 | 54,000 | 3.00 | 54,000 |
| To stockroom | 2,000 | 3.00 | $ 6,000 | 3.00 | $ 6,000 |
| **Stockroom** | | | | | |
| From Dept. No. 2 | 2,000 | $5.20 | $ 10,400 | $15.00 | $ 30,000 |

* Units are equivalent production units for in-process inventories and actual units for raw material and finished goods inventories.

## Factory Ledger Journal Entries

| | | |
|---|---|---|
| Dept. No. 1 — All Elements | $100,000 | |
| Raw Materials | | $48,000 |
| Accrued Payroll | | 32,000 |
| Burden Incurred | | 20,000 |
| For ordinary costs. | | |
| Dept. No. 2 — Materials | 6,000 | |
| Dept. No. 2 — Conversion Costs | 75,000 | |
| Raw Materials | | 6,000 |
| Accrued Payroll | | 38,000 |
| Burden Incurred | | 37,000 |
| For ordinary costs. | | |
| Dept. No. 2 — Prior Dept. Costs | 150,000 | |
| Dept. No. 1 — All Elements | | 60,000 |
| Reserve for Interdepartmental Profit in Inventories | | 90,000 |
| For transfers from Dept. No. 1 to Dept. No. 2. | | |

| | | |
|---|---|---|
| Finished Goods | $ 30,000 | |
| Dept. No. 2 — Prior Dept. Costs | | $10,000 |
| Dept. No. 2 — Materials | | 400 |
| Dept. No. 2 — Conversion Costs | | 6,000 |
| Reserve for Interdepartmental Profit in Inventories | | 13,600 |
| For transfers from Dept. No. 2 to stockroom. | | |
| Cost of Goods Sold — Dept. No. 1 | 30,000 | |
| Dept. No. 1 — All Elements | | 30,000 |
| For product sold by Dept. No. 1. | | |
| Cost of Goods Sold — Dept. No. 2 | 147,600 | |
| Dept. No. 2 — Prior Dept. Costs | | 90,000 |
| Dept. No. 2 — Materials | | 3,600 |
| Dept. No. 2 — Conversion Costs | | 54,000 |
| For product sold by Dept. No. 2. | | |
| Reserve for Interdepartmental Profit in Inventories | 54,000 | |
| Cost of Goods Sold — Dept. No. 2 | | 54,000 |
| For reduction of reserve to required balance. | | |

*Reserve for Imputed Interest on Investment in Inventories.* The purpose of this reserve is to prevent the inclusion in factory costs of imputed interest (say at 5 per cent) on the property used in the fabricating processes from increasing the final stated cost of the inventories of work in process and finished goods. If there were no inventories on hand at any certain date, the use of the reserve would be unnecessary as the extra cost charge would reach the Profit and Loss account through the Work in Process, Finished Goods, and Cost of Goods Sold accounts, and it would there be exactly offset by the credit from the Interest on Investment account (treated as an income item). The presence of inventories delays part of this debit to the Profit and Loss account and the use of the reserve delays an equal portion of the credit to the Profit and Loss account. The debit and credit are:

DEBIT

1. The amount necessary to reduce the balance of the reserve until it exactly equals the "interest on investment" cost element included in the final inventories; the credit is to the Interest on Investment account, which is closed as a financial income to the Profit and Loss account.

CREDIT

1. The amount of the "interest on investment" cost element for the month or other period; the debit is ordinarily to the Burden Incurred account.

The balance of the Reserve for Imputed Interest on Investment in Inventories account may be computed by using special schedules; [7] or by

[7] Lawrence, W. B., *Cost Accounting* (New York: Prentice-Hall, Inc., 1925), pp. 322–323; (1939) Newlove-Smith-White 410–411; Lawrence, W. B., *Cost Accounting*, Third Edition (New York: Prentice-Hall, Inc., 1946), pp. 338–339.

working the problem twice, first with interest excluded from the burden cost elements and second with interest included in the burden cost elements, with the final balance of the reserve determined as the excess of the inventories on the second work sheet over those on the first work sheet.[8] It is much simpler and more expedient, however, to adapt the technique recommended above for the calculation of the final balance of the Reserve for Interdepartmental Profit in Inventories. This technique, when adapted, may be divided into the following steps:

1. Compute the equivalent production using ordinary process costs method.
2. Set up ordinary 3-column process costs inventory schedules for all inventories except Burden in Process and Finished Goods.
3. Set up a special 5-column process cost inventory schedule for Burden in Process and for Finished Goods.
4. Increase the reserve for all imputed interest charged to Burden in Process.
5. Decrease the reserve for the excess of the recorded values over the actual costs for all goods sold to outsiders.
6. Verify that the balance of the reserve equals the excess of the recorded values over the actual costs for all of the final inventories.

The credit entry for step No. 5 is sometimes made directly to Earned Surplus,[9] but it seems more logical to credit a special financial income account, Interest on Investment,[10] as imputed interest should not affect annual net income. The use of the reserve permits the inclusion of imputed interest in factory burden in the relatively few cases in which it is expedient to do so without misstating the annual income.

### *Illustrative Problem*

Give the factory ledger entries for the first two years of a concern having the following outlays:

| | First Year | Second Year |
|---|---|---|
| Raw material costs | $50,000 | $53,100 |
| Direct labor costs | 30,000 | 33,000 |
| Burden costs (exclusive of interest) | 19,000 | 24,000 |
| Interest on investment | 1,000 | 1,000 |
| Units completed (issued on average cost basis) | 45,000 | 54,000 |
| Units in process (half done) | 10,000 | 12,000 |
| Units sold (issued on first-in, first-out basis) | 40,000 | 50,000 |

[8] (1939) Newlove-Smith-White 409–410; (1949) Newlove-Garner 499–502.

[9] Neuner, J. J. W., *Cost Accounting* (Chicago: Business Publications, Inc., 1938), p. 272; Van Sickle, C. L., *Cost Accounting* (New York: Harper and Bros., 1938), pp. 274–275; Van Sickle, C. L., *Cost Accounting*, Second Edition (New York: Harper and Bros., 1947), pp. 274–275.

[10] Newlove, G. H., *Cost Accounts*, Third Edition (Washington: White Press Co., Inc. 1923), p. 64.

*Solution*

**Calculation of Equivalent Production**

(All Cost Elements)

| | First Year | Second Year |
|---|---|---|
| Transferred out | 45,000 | 54,000 |
| Final inventory (weighted as to completion) | 5,000 | 6,000 |
| Total | 50,000 | 60,000 |
| Initial inventory (weighted as to completion) | ..... | 5,000 |
| Equivalent production | 50,000 | 55,000 |

**Operating Statistics**

| | E.P. | Materials in Process | | Direct Labor in Process | |
|---|---|---|---|---|---|
| *First Year* | Units | Rate | Total | Rate | Total |
| New production | 50,000 | $1.00 | $50,000 | $.60 | $30,000 |
| Final inventory | 5,000 | 1.00 | 5,000 | .60 | 3,000 |
| Transferred out | 45,000 | | $45,000 | | $27,000 |
| *Second Year* | | | | | |
| Initial inventory | 5,000 | | $ 5,000 | | $ 3,000 |
| New production | 55,000 | | 53,100 | | 33,000 |
| Total | 60,000 | $ .96⅝ | $58,100 | $.60 | $36,000 |
| Final inventory | 6,000 | .96⅝ | 5,810 | .60 | 3,600 |
| Transferred out | 54,000 | | $52,290 | | $32,400 |

| | Burden in Process | | | | |
|---|---|---|---|---|---|
| | E.P. | Actual Costs | | Recorded Values | |
| *First Year* | Units | Rate | Total | Rate | Total |
| New production | 50,000 | $.38 | $19,000 | $.40 | $20,000 |
| Final inventory | 5,000 | .38 | 1,900 | .40 | 2,000 |
| Transferred out | 45,000 | | $17,100 | | $18,000 |
| *Second Year* | | | | | |
| Initial inventory | 5,000 | | $ 1,900 | | $ 2,000 |
| New production | 55,000 | | 24,000 | | 25,000 |
| Total | 60,000 | $.43⅛ | $25,900 | $.45 | $27,000 |
| Final inventory | 6,000 | .43⅛ | 2,590 | .45 | 2,700 |
| Transferred out | 54,000 | | $23,310 | | $24,300 |

| | Finished Goods | | | | |
|---|---|---|---|---|---|
| | Actual | Actual Costs | | Recorded Values | |
| *First Year* | Units | Rate | Total | Rate | Total |
| New production | 45,000 | $1.98 | $ 89,100 | $2.00 | $ 90,000 |
| Final inventory | 5,000 | 1.98 | 9,900 | 2.00 | 10,000 |
| Transferred out (sold) | 40,000 | | $ 79,200 | | $ 80,000 |
| *Second Year* | | | | | |
| Initial inventory | 5,000 | | $ 9,900 | | $ 10,000 |
| New production | 54,000 | $2.00 | 108,000 | $2.01⅝ | 108,990 |
| Total | 59,000 | | $117,900 | | $118,990 |
| Final inventory | 9,000 | 2.00 | 18,000 | 2.01⅝ | 18,165 |
| Transferred out (sold) | 50,000 | | $ 99,900 | | $100,825 |

**Journal Entries**

| | First Year | | Second Year | |
|---|---|---|---|---|
| Materials in Process | $50,000 | ..... | $ 53,100 | ..... |
| Direct Labor in Process | 30,000 | ..... | 33,000 | ..... |
| Raw Materials | ..... | $50,000 | ..... | $ 53,100 |
| Accrued Payroll | ..... | 30,000 | ..... | 33,000 |
| Burden in Process | 20,000 | ..... | 25,000 | ..... |
| Reserve for Imputed Interest in Inventories | ..... | 1,000 | ..... | 1,000 |
| Burden Incurred | ..... | 19,000 | ..... | 24,000 |
| Finished Goods | 90,000 | ..... | 108,990 | ..... |
| Materials in Process | ..... | 45,000 | ..... | 52,290 |
| Direct Labor in Process | ..... | 27,000 | ..... | 32,400 |
| Burden in Process | ..... | 18,000 | ..... | 24,300 |
| Cost of Goods Sold | 80,000 | ..... | 100,825 | ..... |
| Finished Goods | ..... | 80,000 | ..... | 100,825 |
| Reserve for Imputed Interest in Inventories | 800 | ..... | 925 | ..... |
| Interest on Investment | ..... | 800 | ..... | 925 |
| Profit and Loss | 79,200 | ..... | 99,900 | ..... |
| Interest on Investment | 800 | ..... | 925 | ..... |
| Cost of Goods Sold | ..... | 80,000 | ..... | 100,825 |

If goods are transferred from a department, which includes imputed interest among the costs, to a second department, the Prior Dept. Costs account for the second department should be kept on the special 5-column form.

If it is also desired to include interest on investment as an element among the selling and administrative expenses, the accountant should debit the appropriate expense accounts in those groups and credit the Reserve for Imputed Interest on Investment account for the additional items; this inclusion will be automatically cared for by the debit given above for the reserve.

*Reserve for Amortized Appreciation in Inventories.* The purpose of this reserve is to prevent the inclusion in cost of production of amortized appreciation on property used in the fabricating processes from causing an increase in the final stated cost of the inventories of work in process and finished goods. As is explained in a later chapter of this text, some firms record a formal appraisal of their fixed properties on their books. The question then arises as to the disposal of the appreciation. If the amortization of the appreciation is treated as a cost element, it will become part of the inventory cost of any items on hand at any particular date. The purpose of this reserve, therefore, is to avoid stating the inventories at a higher figure than would be the case if the amortized appreciation is not treated as a cost element. The debit and credit are:

DEBIT

1. The amount necessary to reduce the balance of the reserve until it exactly equals the "amortized appreciation" cost element included in the final inventories; the credit is ordinarily to Earned Surplus account.

CREDIT

1. The amount of the "amortized appreciation" cost element for the month or other period; the debit is to Reserve for Unrealized Appreciation account or Revaluation Surplus account, whichever title is used.

This reserve is deducted from the final inventories on the balance sheet; it will naturally have no balance if there are no inventories. The entries to this reserve are illustrated in the solution to the problem on page 384.

*Reserve for Amortized Cost Debit Adjustment in Inventories.* The purpose of this reserve is to prevent the inclusion in cost of production of amortized cost debit adjustment (see treatment at end of Chapter 11) from increasing the final stated cost of the inventories of work in process and finished goods. The debit and credit are:

DEBIT

1. The amount necessary to reduce the balance of the reserve until it exactly equals the "amortized cost debit adjustment" cost element included in the final inventories; the credit is ordinarily to the Earned Surplus account.

CREDIT

1. The amount of the "amortized cost debit adjustment" cost element for the month or other period; the debit is to Earned Surplus account.

This reserve should be deducted from the final inventories on the balance sheet. The entries to this reserve are illustrated in the solution to the problem on page 384.

*Reserve for Amortized Devaluation in Inventories.* The purpose of this reserve is to enable the accountant to price the inventories correctly for income tax purposes, when the property used in the fabricating processes has been devalued and when the depreciation included in cost of production is based on the appraised valuation. The debit and credit are:

DEBIT

1. The amount of the "amortized devaluation" element for the period; the credit is to the Earned Surplus account.

CREDIT

1. The amount necessary to reduce the balance of the reserve until it exactly equals the excess of the valuation of the inventories based on amortized original cost valuation of fixed assets, over the valuations of the inventories based on amortized appraised valuations when the appraisal shows a devaluation of the fixed assets.

As will be explained in a later chapter of this text, the Reserve for Amortized Devaluation in Inventories account will ordinarily have a debit balance. This may be confusing to some lay readers of the balance sheet; in this event the balance of the reserve should be added to the inventories before preparing the balance sheet. The entries to this reserve are illustrated on pages 381–382.

*Reserve for Amortized Cost Credit Adjustment in Inventories.* The purpose of this reserve is to enable the accountant to price the inventories correctly for income tax purposes when the estimated life of the property used in the fabricating processes has been reduced by an appraisal and when the depreciation included in cost of production is based on the sound value at date of appraisal (see discussion in Chapter 11).

The debit and credit are:

DEBIT

1. The amount of the "amortized cost credit adjustment" element for the period; the credit is to the Earned Surplus account.

CREDIT

1. The amount necessary to reduce the balance of the reserve until it exactly equals the excess of the valuation of the inventories based on amortized original cost valuation of fixed assets (as per income tax procedure), over the valuations of the inventories based on amortized sound valuations at date of appraisal when the appraisal decreased the estimated life of the fixed assets.

As will be explained in a later chapter of this text, the Reserve for Amortized Cost Credit Adjustment in Inventories will ordinarily have a debit balance. This may be confusing to some lay readers of the balance sheet; in this event the balance of the reserve should be added to the inventories before preparing the balance sheet. The entries to this reserve are illustrated on pages 381–382.

**Valuation-accrual reserves.** These reserves are designed to value their related accounts at the date of a balance sheet. They differ from pure valuation reserves in that their balances are closed into the related expense or income accounts at the start of the ensuing accounting period instead of being merely adjusted at the end of the present accounting period. From the standpoint of technique, they are set up by means of adjusting entries as though they were pure valuation reserves; subsequently, they are closed by means of readjusting entries as though they were accrued accounts.

These reserves are deducted from their related accounts on the balance sheet. At the close of an accounting period, they are credited in order to accrue the related income or expense. At the start of the ensuing accounting period, the valuation-accrual reserves are closed by journal entries which exactly reverse the adjusting entries.

*Reserve for Cash Discounts on Sales.* This reserve indicates the estimated amount of the cash discounts which will be taken by the customers (recorded at gross sales price). In order to facilitate the recording of the cash discounts for prompt payment as actually taken during the following accounting period, the adjusting entry, which established the reserve at the close of the period, is reversed at the start of the next period. The debit and credit are:

DEBIT

1. At the start of an accounting period, the balance of the account is closed out; the credit is to the Sales Discount account.

CREDIT

1. At the end of an accounting period, the reserve is set up for estimated cash discounts for prompt payment which will be allowed on the current accounts receivable; the debit is to the Sales Discount account.

*Reserve for Cash Discounts on Purchases.* When purchases are recorded at gross invoice price, the estimated cash discount for prompt payment which will probably be taken on the accounts payable on the balance sheet may be recorded in the Reserve for Cash Discounts on Purchases account. This estimation is reversed at the start of the next accounting period in order to simplify the journalization of cash discounts on purchases actually taken. The debit and credit are:

DEBIT

1. At the end of the accounting period, the reserve is set up for the estimated cash discounts to be taken on the current accounts payable; the credit is to the Purchase Discount account.

CREDIT

1. At the start of an accounting period, the balance of the account is closed; the debit is to the Purchase Discount account.

This account will ordinarily have a debit balance at the time the balance sheet is prepared. This may be confusing to some lay readers; in this event it may be helpful to show the Accounts Payable net on the balance sheet without showing the deduction of the reserve.

Other examples of this class of reserve are:

a. Reserve for Freight Allowances on Receivables
b. Reserve for Sales Returns and Allowances
c. Reserve for Collection Expense

**Liability-accrual reserves.** Some accountants prefer to use the reserve title in lieu of the ordinary accrued liabilities; this is especially the case where the amount of money involved is in some doubt. The use of the term "reserve" in connection with these accounts is unfortunate, as it

simply confuses the lay reader. It is preferable to use, therefore, a title which does not contain the word "reserve." For example:

| Titles Sometimes Found | Preferable Titles |
|---|---|
| Reserve for Property Taxes | Accrued Property Taxes |
| Reserve for Wages | Accrued Wages |
| Reserve for Unclaimed Wages | Unclaimed Wages Payable |
| Reserve for Rent | Accrued Rent Expense |
| Reserve for Social Security Taxes | Social Security Taxes Payable |
| Reserve for Franchise Taxes | Franchise Taxes Payable |
| Reserve for Workmen's Compensation Insurance | Workmen's Compensation Insurance Payable |

**Budgetary-liability reserves.** Budgetary-liability reserves are similar to the pure budgetary reserves in that they serve to allocate equitably over the fiscal period (or series of periods) costs, expenses, or other charges which are actually paid at irregular intervals. These budgeted items, while predictable in a general way, may not occur until future fiscal periods. The budgetary-liability reserves may, therefore, have credit balances, which represent deferred payments (that is, current liabilities). It is important to distinguish between budgetary-liability reserves, which take care of predictable items by a charge to cost of production or directly to Profit and Loss account, and appropriated earned surplus reserves (discussed in a later section of this chapter), which cover unpredictable items. As a general rule, budgetary-liability reserves budget their related charges by setting up liabilities for the estimated future outlays; actual payments are debited to these reserves as deductions from the previously established liability.

When balance sheets are prepared these reserves are ordinarily shown as current liabilities; there is some disagreement, however, concerning the Reserve for Fire Insurance (see below).

*Reserve for Income Taxes (Current Year).* As income taxes do not necessarily accrue with the passing of time, and since they are somewhat uncertain in amount until the government has accepted the return, the use of Reserve for Income Taxes (Current Year) is advisable particularly in those concerns preparing monthly, quarterly, or semiannual financial statements. This current liability account has the following entries:

DEBITS

1. Payments made to the government; the credit is to Cash account.
2. Decreases in estimates of income taxes; the credit is to Income Tax account if determined before the books are closed for the fiscal year.

CREDIT

1. Estimations made of the income taxes for the current period to date; the debit is to the Income Tax account.

If the corporation is subject to both federal income taxes and state income taxes, it is advisable to set up two accounts to handle the estimates.

*Reserve for Predictable Losses on Guarantees.* This account takes care of the budgetary estimate of the expense or cost involved through the practice of guaranteeing the quality and performance of product sold. As is well-known, many firms "make good" the service to be rendered by their product for periods up to ten years or longer. (If these items are not reasonably predictable, a special earned surplus appropriated reserve may be established — see discussion in later section below.) Actual costs of making good the guarantees are debited to this reserve; the remainder at any date is a current liability. The debits and credit are:

DEBITS

1. Payments made to make good the guarantees; the credit should be allocated to the Cash, Accrued Payroll, Finished Goods, and other accounts affected.
2. Decreases in estimations of costs; the credit is to the Predictable Losses on Guarantees account.

CREDIT

1. Estimations made of the cost of making good the guarantees; the debit is to the Predictable Losses on Guarantees account.

*Reserve for Repairs.* This account handles the budgeting of the cost of repairing fixed assets according to the use made of the assets instead of according to the dates on which the repairs happen to be made. The debits and credits are:

DEBITS

1. Amounts paid outsiders for performing repairs; the credit is to the Cash account.
2. Cost of repairs made by factory employees; the credit is to Work in Process account when factory orders are issued for the repairs, and to the Burden Incurred account when factory orders are not issued for the repairs.
3. Correction adjustment, if the annual budgetary allowance is excessive; the credit is to the Budget Adjustment account which in turn may be closed to the Profit and Loss account.

CREDITS

1. Budgetary estimations of normal cost of repairing the fixed assets; the debit is to the Repair Cost account.
2. Special budgetary estimation of extraordinary cost of repairing the fixed assets due to neglect in the past; the debit is to a special repair cost account which is in turn closed to Profit and Loss account.
3. Correction adjustment, if the annual budgetary allowance is insufficient; the debit is to the Budget Adjustment account which in turn may be closed to the Profit and Loss account.

At any certain date the Reserve for Repairs account equals the estimated cost of the authorized repairs not yet made. Since these repairs are

not contingent, the balance must be treated on the balance sheet either as a deduction from the fixed assets or as a current liability. The present authors believe that since the deferred repairs constitute a demand on the working capital of the concern, the Reserve for Repairs should be listed among the current liabilities. *Accounting Research Bulletin No. 30* says: "This concept of current liabilities would include operating reserves which are expected to be required to cover expenditures within the year."

*Reserve for Pensions.* When pension payments are viewed as deferred wages, the Reserve for Pensions should be created by current charges against operations. The balance of the account at any certain date may be either a current liability or a fixed liability depending upon the expected date of exact payment. The entries are:

DEBIT

1. Payments made to pensioners; the credit is to the Cash account.

CREDIT

1. Current period's allowances for pensions; the debit is to the Labor or Wages Cost account involved.

*Reserve for Fire (or other casualty) Loss.* This reserve is often called "Reserve for Self-Insurance." The latter term is misleading, however, since insurance infers the sharing of risk with others, and when this reserve is used the risk is assumed by the company in question. Naturally only owners of numerous, scattered properties should assume their own risks. But given enough property, scattered so that one fire would destroy only one unit, an industrial concern may make periodic charges to its cost or expense accounts to substitute for the premiums which would otherwise be paid out to insurance firms. The expectation is that actual losses sustained over a period of years will be less than the premiums on regular policies. Since this reserve does not constitute an obligation of the firm, it is not generally classified as a liability. In most cases the balance of the account is shown as a separate caption on the right-hand side of the balance sheet just after current liabilities,[11] although it is sometimes called a surplus reserve.[12]

DEBITS

1. The unamortized book values of the assets destroyed by fire or other casualty; the credit is to the accounts for the destroyed assets.

2. Correction adjustment if the allowances are excessive; the credit is Excess Provision for Fire (or other casualty) Loss account which in turn is closed out to Profit and Loss account.

[11] (1942) Rosenkampff-Wider 460; (1947) Langer, Lecture 22, p. 3; see specific example on January 31, 1940, balance sheet of Mandel Brothers, Inc.; (1942) Holmes 484 (called "liability profit-and-loss" reserve).

[12] (1947) Johnson 236.

CREDITS

1. The periodic allowances for fire based on past experience (usually slightly less than the normal insurance premiums); the debit is to the Imputed Fire (or other casualty) Cost (or Expense) account.
2. Correction adjustment if the allowances are insufficient; the debit is to a special account for Fire Loss (or other casualty) Not Previously Established on Books, which in turn is closed out to the Profit and Loss account.

There is considerable disagreement among accountants as to the specific classification of this reserve. A viewpoint opposite from the above is that the Reserve for Fire Loss is a subdivision of earned surplus,[13] since losses are hypothetical until the casualty occurs. Under this explanation it would be shown in appropriated earned surplus until the loss actually occurs; it is not, therefore, a liability because the losses do not accrue with the passing of time or other similar factors. This conclusion has ample support, of course, where the creation of the reserve comes about by charges to Earned Surplus account, rather than to periodic cost or expense accounts. The present authors recognize the cogency of this reasoning and recommend that such "self-insurance" reserves be used only by firms which have sufficient experience to enable them to predict the losses with a high degree of accuracy. Pending such time, if the risk is assumed by the concern, an earned surplus appropriated reserve may be established by the directors. Under this treatment, if a fire or other casualty actually occurs, the amount of the loss is debited to Fire Loss account which in turn is closed to Profit and Loss account. The earned surplus appropriated reserve is closed back into Earned Surplus account when the directors think it desirable to do so.

Other examples of budgetary-liability reserves are:

1. Reserve for Workmen's Compensation (when insurance is not carried)
2. Reserve for Flood Damage (when insurance is not carried)
3. Reserve for Losses Due to Accidents and Injuries
4. Reserve for Outstanding Premium Coupons (given out with product sold)
5. Reserve for Outstanding Tickets or Tokens
6. Reserve for Containers in Hands of Customers
7. Reserve for Improvements to be Made on Leased Property before it Reverts to Owner
8. Reserve for Maintenance
9. Reserve for Relining and Rebuilding Furnaces

**Unrealized surplus reserve.** This reserve is sometimes used to record write-ups of assets resulting from the recording of appraisals on the books. After being established on the books it is regularly carried by accountants as a surplus item in the proprietorship section. The tendency

[13] (1943) Paton 1037; (1934) Montgomery 430.

in recent years has been to call the account "Reserve for Unrealized Appreciation," rather than "Unrealized Surplus." This type of reserve is discussed more at length in Chapter 11.

**Appropriated earned surplus reserves.** *For possible losses.* Reserves of this class are often called "contingency reserves." Their essential purpose is to reduce earned surplus on the balance sheet in order to indicate to the reader that certain specified or unspecified losses may occur in the future. It should be definitely understood, however, that reserves of this class do *not* "provide" for the contingent loss, with the possible exception that the directors may be inclined not to declare so many cash dividends during the time the reserves are on the books. This may or may not (depending upon the circumstances) make the corporation financially more able to absorb the contingent loss which at the moment is not actually known or determined.

In the opinion of the authors, the accountant should act in an advisory capacity only, when decisions are pending concerning the establishing of this class of reserve. In other words, the matter is not *per se* an accounting problem.[14] If the accountant has determined that a certain charge is not of sufficient definiteness to warrant its being matched against the revenue of the period, his responsibility is concluded except for possible notation in a footnote or otherwise. This viewpoint in no way detracts from the importance of the matter; it means rather that there is no halfway medium for handling possible losses on the balance sheet or other statements. If the losses in question are not capable of being objectively determined in accordance with the accounting standards applied by the accountant (and this is his responsibility), the setting up of earned surplus appropriated reserves of this subclass accomplishes no worthwhile purpose.[15]

The directors may formally recommend that these reserves be set up for a large variety of reasons, such as:

1. Flood Losses (if not handled as a budgetary-liability reserve)
2. Strike Losses
3. Accidents
4. Past Decline in Inventory (if not handled as a pure valuation reserve)
5. Future Decline in Inventory
6. Pending Lawsuits
7. Unpredictable Obsolescence
8. Patent Infringement Losses
9. Purchase Commitments
10. Contingencies (not specially stated)

As noted above, care must be taken to see that all past losses due to accidents, guarantees, obsolescence, floods, and the like are not accounted

[14] (1945) Leland, Ch. 4, p. 10.
[15] (1938) Paton 709.

for in these contingency reserves. Past losses are not contingent and should not be recorded as such. All of these reserves are set up out of Earned Surplus, and after the contingency has passed they are closed back into Earned Surplus. If the loss actually occurs, a special account is created therefor; this special account is later charged against the revenues of the period.[16]

The Committee on Accounting Procedure of the American Institute of Accountants has made a very careful study of this matter, and in *Accounting Research Bulletin No. 28* reports as follows (quoted by permission):

. . . .

2. The purpose of the committee in the issuance of this bulletin is to establish criteria which will promote sound accounting procedures for the treatment of general contingency reserves and lead to greater uniformity in reporting net income. The committee believes the action taken in this bulletin is in accordance with the current trend of accounting thinking and practice. In reaching this conclusion consideration has been given to the declining use of general purpose contingency reserves as charges to income and to the general recognition that their use may either arbitrarily reduce income or be the means of shifting income from one year to another.

3. When a reserve is provided by a charge to income, the amount recorded as net income for the period is correspondingly reduced. If the provision is not properly chargeable to current revenues, net income for the period is understated by the amount of the provision. If such a reserve should then be used to relieve the income of subsequent periods of charges that would otherwise be made thereagainst, the income of such subsequent periods would be thereby overstated. When a reserve is used in this manner, profit for a given period may be significantly increased or decreased by mere whim. ("It is not permissible to create reserves for the purpose of equalizing reported income." *Accounting Research Bulletin No. 13*, p. 112.)

When this practice is followed, the integrity of financial statements is impaired and they tend to be misleading and of doubtful value. The committee is therefore of the opinion that general contingency reserves, such as those created:

a. for general undetermined contingencies, or
b. for a wide variety of indefinite possible future losses, or
c. without any specific purpose reasonably related to the operations for the current period, or
d. in amounts not determined on the basis of any reasonable estimates of costs or losses,

are of such a nature that charges or credits relating to such reserves should not enter into the determination of net income.

4. Accordingly it is the recommendation of the committee that, as to general contingency reserves described in paragraph 3:

a. Provisions for such reserves should not be included as charges in determining net income.

b. When such a reserve is set up it should be created preferably by a segregation or appropriation of surplus; it may be created by an appropriation of net income but this is less desirable.

c. If such a reserve is created by an appropriation of net income, the net income

[16] (1944) Sunley-Carter 145–151.

should first be determined and so designated, after which the reserve provision should be deducted and clearly captioned as an appropriation of net income and the final figure should be so captioned as to clearly indicate that it is not the entire net income.

d. Costs or losses should not be treated as charges to such reserves and no part of such a reserve should be transferred to income or in any way used to affect the determination of net income for any year. (This paragraph also applies to general purpose contingency reserves set up in prior years.)

e. When such a reserve or any part thereof is not longer considered necessary it should be restored to surplus, either directly (the preferable treatment) or after the determination of net income, in the income statement, in such a way as to indicate clearly that it is not income. (This paragraph also applies to general purpose contingency reserves set up in prior years.)

Several months later, the Committee expressed its views more positively in *Bulletin No. 35* (quoted on pages 156–157).

*For other purposes.* Earned surplus appropriated reserves are often established for purposes other than to indicate possible losses. This subclass is sometimes called "true surplus reserves," and their purpose is to earmark earned surplus (and thus possibly reduce the dividends declared during the time the reserve is on the books) pending the carrying out of some corporate transaction not definitely related to current operations. These reserves, which are created out of earned surplus, are eventually closed back into the Earned Surplus account (but this may be delayed for many years in some cases), and are shown as segregations of earned surplus on the balance sheet (while they are still on the books).[17]

Some examples of this class of reserves are:

1. Reserve for Debt Extinguishment (often called Reserve for Bond Sinking Fund)
2. Reserve for Preferred Stock Redemption
3. Reserve for Earned Surplus Invested in Plant
4. Reserve for Plant Investment
5. Reserve for Plant Extension
6. Reserve for Purchased Treasury Stock (see discussion in Chapter 3)
7. Reserve for Undeclared Dividends
8. Reserve for Equalization of Dividends
9. Reserve for Capital Expenditures
10. Reserve for Expansion
11. Reserve for Working Capital
12. Reserve for Dividends in Arrears on Cumulative Preferred Stock

Most of the reserves in the preceding list are established on a voluntary basis by formal action of the corporate directors. However, the Reserve for Bond Sinking Fund is occasionally required by the bond indenture (contract), and the Reserve for Purchased Treasury Stock may be required by the appropriate state statute.

[17] *Accounting Research Bulletin No. 39.*

# CHAPTER 6

## Corporate Dividends: Legal and Accounting Aspects

**General.** Dividends have long been the subject of much discussion among accountants, lawyers, economists, and corporate managers. The problems and questions involved have been given exhaustive treatment by the many authorities who have investigated the subject.[1] This treatment has been concerned with the following matters: (1) Purposes of dividend regulation; (2) restrictions on dividends by common law and statutes; (3) problems of corporate surplus administration; and (4) accounting for the various types of dividends. Each of these topics is discussed below.

**Purposes of dividend regulation.** Dividend regulation had its early origin in the anxiety of the courts and legislatures to give adequate protection to creditors of the corporation. Even in most of the early charters granted to corporations, the stockholders were not subject to unlimited liability. Instead, various rules and provisions were enacted making the directors responsible for declaring dividends "not out of capital," whatever the phrase might mean. It was not long after 1800 that Justice Story enunciated the famous trust fund doctrine[2] in which he expressed the opinion that the capital stock of a bank was to be viewed as a pledge or trust fund for taking care of the debts of the corporation. While this particular view has since met with considerable criticism, it has nevertheless given substance to many of the later corporate laws and court decisions relative to dividends. In more recent times, however, the solicitude for creditors has been minimized to a considerable degree.[3] The attitude is no longer taken that corporations are fly-by-night affairs in constant danger of bankruptcy with loss to creditors. While insolvencies are still a real problem, the courts and statutes are now generally motivated by other considerations when it comes to dividend regulation. This latter conclusion is evidenced by laws allowing, for example, the issuance of no-par stock with a stated value less than the consideration received, the difference being in some jurisdictions available for certain types of dividends (see discussion in next section). In addition, there is a tendency toward the type of statute which allows dividends from current profits without regard to so-called capital impairment. All of this gives support to the fact that creditor protection is no longer paramount in dividend restriction.

[1] (1941) Kehl (entire book); Littleton, 16 *Harvard Business Review* 51; Van Arsdell, 13 *Accounting Review* 275.
[2] *Wood v. Dummer*, 3 Mason 308 (1824).
[3] (1941) Kehl 17.

Within the last several decades, the attention of the courts and other authorities has also shifted to the maintenance of contributed capital in the interest of stockholders. While there is no definite agreement as to the specific implications of this purpose of dividend regulation, its general outline is clear. Simply speaking, it is that the stockholder would have as much equitable reason as a creditor to object to a dividend being paid out of contributed capital (assuming a going concern), especially without his knowledge or consent. Many courts have emphasized this purpose, and have made extensive comments on the duty of directors in this respect.[4] Particularly in large corporations with scattered ownership, the stockholders must by necessity rely upon the good faith of the directors to protect their interests. This good faith involves, among other things, the questions of (1) dividends from profits versus some form of capital, (2) the rights of different classes of stock as to dividends, and (3) the effect of dividends on market prices of the shares. All of these questions enter into the more modern purposes of dividend regulation.[5]

A third purpose of dividend regulation involves the requirement of adequate accounting disclosure of the facts relating to dividends. As one authority has expressed it: "The declaration of dividends is as much an accounting question as it is a legal problem."[6] This has several implications. For instance, in order to present facts most intelligently it is desirable that the uses to which the facts are to be put be carefully outlined. This means that accountants should have certain goals in mind as they gather the facts regarding dividends. The pertinent facts are associated with the determining of the current position of the corporation, the recording of contributed capital, and the realization of revenue. These goals obviously strike deep into the accounting process and make the adequate accounting disclosure purpose of dividend regulation a highly significant matter.

Lastly, dividend regulation is a matter of broad public interest. Many corporations today are vital cogs in the economy. The size or type of dividends paid has possible repercussions in several directions — all affected by the public interest. Prospective investors, employees, and customers (like the stockholders and creditors) have a stake in dividend policies. Their interests have received added attention in recent years.

**Restrictions on dividends: common law and statutes.** The discretion of corporate directors in the declaration of dividends has been limited by statutes and by court decisions.[7] While all the states today make some

[4] *Hutchinson v. Stadler*, 83 N.Y.S. 509 (1903).
[5] Littleton, 9 *Accounting Review* 140.
[6] (1941) Kehl 20.
[7] The following references bear specifically on this matter: Ballantine, 23 *California Law Review* 229–263; Lundahl, 7 *Accounting Review* 188–193; Payne, 8 *Accounting Review*

provision for dividend restriction, the court cases are still significant and controlling in instances where appropriate statutory jurisdictions are in question. As noted in the previous section, the early cases were concerned mostly with rulings on capital impairment. In later years, on the other hand, the emphasis has been on profits as a test. The two tests, however, are closely interrelated.[8] One court, for example, made the statement that "the payment of a dividend is, in the absence of a statement to the contrary, a representation that the payment is a distribution of earnings rather than a return of contributed surplus." [9] The courts do not, as a rule, attempt to make so sharp a distinction between the various classes of surplus as the several statutes, especially when it concerns the "fund" available for dividends. In most instances (at least in modern times) a majority of cases involve questions of (1) equitable relationships between preferred and common stockholders, (2) rescission of dividends, (3) dividends while insolvent, and the like.[10]

Modern corporation statutes approach the question of dividend restriction from several points of view. In addition, no great amount of uniformity exists between the several jurisdictions. The problems become serious if a corporation is chartered, for example, in one state and has its principal place of business in a different state. Another question is concerned with the defining and interpreting of the dividend base as provided by statute; this is especially significant in view of the confused state of the terminology relating to surplus, capital, and insolvency. Corporation law and accounting go hand in hand in deciding some of the issues involved. While it is not the accountant's final responsibility to decide the doubtful cases, it is his responsibility to maintain and furnish data concerning the status of the accounts at any given time. It is upon this viewpoint that the present discussion is predicated.

The statutory restrictions as to the sources of dividends may be classified as follows:

1. Dividends are forbidden if a declaration may render the corporation insolvent. For example, the Ohio Act reads: "No corporation shall declare or pay a dividend in cash or other property when there is reasonable

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1–10; Lewis, 8 *Accounting Review* 145–154; Payne, 13 *Certified Public Accountant* 669–676; Littleton, 9 *Accounting Review* 140–148; Ballantine-Hills, 10 *Accounting Review* 246–268; Pinkerton, 15 *N.A.C.A. Bulletin* 1271–1278; Weiner, 28 *Columbia Law Review* 1046–1060; Weiner, 29 *Columbia Law Review* 461–482, 906–917; Weiner-Bonbright, 30 *Columbia Law Review* 330–358, 954–985; Sparger, 8 *North Carolina Law Review* 14–30; Briggs, 9 *Accounting Review* 220–236; Briggs, 53 *Journal of Accountancy* 346–353; Briggs, 54 *Journal of Accountancy* 29–37; Briggs, 13 *Certified Public Accountant* 329–332, 371; Deinzer, 10 *Accounting Review* 339–342; (1938) Sanders-Hatfield-Moore 45–52; McCormick, 88 *Journal of Accountancy* 196–207.

[8] (1941) Kehl 24.

[9] *Ottinger v. Bennett*, 203 N.Y. 554.

[10] (1939) Ballantine-Lattin 431–496.

ground for believing that it is unable or by the payment of the dividend, may be rendered unable to satisfy its obligations and liabilities." [11] The statutes frequently fail to identify which of the two meanings of insolvency is intended: (1) the inability to meet debts as they fall due, or (2) the excess of liabilities over the total book value of the assets.

2. Dividends are payable out of "surplus," that is, limited to the excess of the assets over the legal or stated capital. The Stock Corporation Law of New York (1939) reads: "No stock corporation shall declare or pay any dividend which shall impair its capital, nor while its capital is impaired, nor shall any such corporation declare or pay any dividend — unless the value of its assets remaining after the payment of such dividend . . . shall be at least equal to the aggregate amount of its debts and liabilities, including capital." [12]

3. Dividends sometimes are payable only out of "earned surplus" with certain exceptions being specified in the statutes. The Michigan Corporation Act (1931) reads: "The directors of every corporation . . . shall have power to declare and pay dividends upon the shares of its capital stock either from earned surplus or from net earnings. In determining earned surplus, appreciation of value of the assets of the corporation shall not be included until realized. . . . Nothing contained in this shall prevent a corporation from declaring and paying dividends upon its preferred stock from any surplus; provided, that if such dividend shall be declared and paid from any surplus other than earned surplus the stockholders receiving the same shall be advised of that fact at the time of payment to them and the next annual statement of accounts to be given to the shareholders shall indicate the surplus from which such dividend was paid." [13] The Business Corporation Act of Illinois (1933) reads: "No dividend, except a dividend payable in its own shares, shall be declared or paid out of surplus arising from unrealized appreciation in value, or revaluation, of assets." [14] The Pennsylvania Act is even more restrictive for it reads: "The unaccrued or unearned portion of any unrealized profit in any form whatever, in the form of notes, bonds, obligations for the payment of money, installment sales, credits, or otherwise" can be distributed only in the form of share dividends. [15]

4. Dividends sometimes are payable out of the profits of the current year even though capital is impaired. The Delaware General Corporation Law (1935) gives the directors power to declare and pay dividends "(a) out of its net assets in excess of its capital . . ., or (b) in case there shall be

[11] Section 8623–38, amended by Law 1929.
[12] Section 58.
[13] Section 32.
[14] Section 41.
[15] Section 702.

no such excess, out of its net profits for the fiscal year then current and/or the preceding fiscal year; provided, however, that if the capital of the corporation computed as aforesaid shall have been diminished by depreciation in the value of its property, or by losses, or otherwise, to an amount less than the aggregate amount of the capital represented by the issued and outstanding stock of all classes having a preference upon the distribution of assets, the directors of such corporation shall not declare and pay out of such net profits any dividends upon any shares of any classes of its capital stock until the deficiency in the amount of capital represented by the issued and outstanding stock of all classes having a preference upon the distribution of assets shall have been repaired." [16]

5. "Wasting asset" industries, like mines and oil wells, frequently are not required to maintain their legal capital and can declare dividends chargeable to depletion reserves. The Michigan Act reads: "Nothing in this act contained shall prevent a corporation, whose business consists substantially of the exploitation of wasting assets, from paying dividends without making deduction for the depletion of such assets resulting from the lapse of time or from the consumption or sale of such assets incidental to their exploitation." [17]

In order to indicate the relative popularity of the several tests given above, the following data [18] are presented:

| Dividend Test | Number of States | |
|---|---|---|
| | Laws 1925 | Laws 1933 |
| No provision | 2 | 0 |
| (a) Insolvency alone | 4 | 1 |
| (b) Capital impairment alone | 4 | 7 |
| (c) Profits alone | 5 | 4 |
| (a) and (b) combined | 9 | 10 |
| (b) and (c) combined | 17 | 19 |
| (a) and (c) combined | 5 | 3 |
| (a) and (b) and (c) combined | 3 | 5 |

According to this table the favorite combination in 1933 as well as in 1925 was the capital impairment and profits tests, with insolvency and capital impairment combined taking second place. Together these two types of statutory restrictions were the choice of twenty-six states in 1925 and twenty-nine in 1933.

It is obvious that many phrases used in the several statutes are vague and require interpretation. Some progress in avoiding ambiguity has been

[16] Section 34.
[17] Section 22.
[18] Littleton, 16 *Harvard Business Review* 51.

accomplished in recent years, especially with the adoption in part at least (by several states) of the Uniform Business Corporation Act. This Act was drafted by the National Conference of Commissioners of Uniform State Laws and was approved at the 1928 meeting of the American Bar Association. Because of the general accounting interest in such a law, Section 24 on dividends is quoted at length below:

SECTION 24; Dividends: *Method of Estimating Fund For Payment Of:*

I. Every corporation formed shall carry upon its books as a liability the amount of its capital stock as defined in Sec. 1 subdivision X.

II. Amounts of surplus arising from an unrealized appreciation or revaluation of fixed assets shall be shown on the books of the corporation as a separate item, apart from surplus profits or paid-in surplus.

III. In computing the aggregate of the assets of the corporation, the board of directors shall determine and make proper allowance for depreciation and depletion sustained, and losses of every character. Deferred assets and past expenses shall be written off at least annually in proportion to their use as may be determined by the board of directors.

IV. No corporation shall pay dividends
   (a) In cash or property, except from surplus of the aggregate of its assets over the aggregate of its liabilities, including in the latter the amount of its capital stock, after deducting from such aggregate of its assets the amount which such aggregate was increased by unrealized appreciation in value or revaluation of fixed assets.
   (b) In shares of the corporation, except from the surplus of the aggregate of its assets over the aggregate of its liabilities, including in the latter the amount of its capital stock.

V. Cash dividends shall not be paid out of surplus due to or arising from
   (a) Any profit on treasury shares before resale; or
   (b) Any unrealized profits due to increase in valuation of inventories before sale; or
   (c) The unaccrued portion of unrealized profits on notes, bonds, or obligations for the payment of money purchased or acquired at a discount unless such notes, bonds, or obligations are readily marketable, in which case they may be taken at their actual market value; or
   (d) The unaccrued or unearned portion of any unrealized profit in notes, bonds, or obligations for the future payment of money, installment sales, credits or otherwise.

VI. Subject to the limitations contained in this Section a dividend may be declared in shares of the corporation whenever the board of directors so determines. Provided that,
   (a) If the dividend is to be paid in shares having a par value, the aggregate par value of such shares shall not exceed the amount of that portion of the corporation's surplus which is transferred to capital as payment of such shares;
   (b) If the dividend is paid in shares having no par value, the number of such shares may be fixed by the board of directors;
   (c) No dividend payable in shares of any class shall be paid to shareholders of any other class unless the Articles so provide or such payment is author-

ized by the holders of a majority of the shares of the class in which the payment is to be made.

VII. A corporation which owns wasting assets intended for sale in the ordinary course of business, such as mines, oil or gas wells, or a corporation which owns property having limited life, such as a lease for a term of years, or patent, need not deduct the depletion of such assets by sale or lapse of time in the computations of the funds available for dividends, and such a corporation may pay dividends from its net profits arising from its business without deduction of such depletion, subject, however, to the rights of shareholders of different classes.

**Problems of corporate surplus administration.** Dividend policy and surplus administration are intimately related. This statement is apparent when it is recalled that dividends (except liquidating distributions) are in the final analysis debited to some class of surplus, usually earned surplus. Thus if the decision of the directors is to declare dividends only to a determined extent in relation to periodic income, it means that the surplus is being administered in accordance with certain notions and goals in mind. The several ramifications of this are to a large extent outside the province of the accountant; more specifically they relate to legal, economic, and financial matters. Yet, it is only reasonable to presume that adequate accounting is a necessary concomitant "for a tenable doctrine of surplus administration. Only by careful accounting analysis of the sources and disposition of surplus, with special reference to the commitment of funds obtained from undistributed profits, can sound dividend programs be effected." [19] Therefore, whatever the objective of surplus administration may be — (1) expansion of the business, (2) a safety factor for risks, or (3) a guidepost for dividends — it is incumbent upon the accountant to furnish critical documentary evidence which will assist the management in carrying out the corporate purposes. Accountants can also contribute to a stockholder's understanding of the financial objectives by the thoughtful selection of terms and expressions used on the statements.

**Accountancy dividend standards.** The implications of corporate distributions from the standpoint of accounting have long been the subject of considerable debate. On the one hand, some accountants view the matter as primarily a legal problem. On the other hand, many persons express the opinion that while accountants must obey the law as stated in court decisions and statutes, they exert a considerable influence on the law because many judges look to standards of accounting for aid in preparing decisions.[20] Accountants can undoubtedly inject a steadying and progressive effect into the whole question which will work toward the gradual strengthening of the laws and attitudes affecting dividends. While account-

[19] Van Arsdell, 13 *Accounting Review* 283.
[20] Briggs, 13 *Certified Public Accountant* 371.

ants are not as yet by any means unanimous in their opinions as to the appropriate standards to be adopted, there is a considerable degree of acceptability of the matters discussed in the several paragraphs below.

*Availability of earned surplus for distribution.* Both the legal and accounting standards agree that earned surplus, whether appropriated or unappropriated, is available for any kind of dividends unless restricted by contract or by applicable statute. As noted in Chapter 4, the Reserve for Sinking Fund account stipulated in a bond contract and the permanent surplus required by statute of national banks are illustrations of the restrictions placed on the declaration of earned surplus as dividends. The Securities and Exchange Commission [21] requires the disclosure of dividend restrictions on various types of surplus in the following characteristic situations:

1. Treasury stock has been acquired.
2. Dividend arrearages exist on cumulative preferred stock.
3. The preference of preferred shares upon involuntary liquidation exceeds the par or stated value of such shares.
4. The provisions of a trust indenture or loan agreement permit dividends on common or preferred stock to be paid only from earnings accumulated subsequent to a specified date or if surplus exceeds a certain amount.
5. The provisions of a trust indenture or loan agreement prohibit the payment of dividends when such payment would reduce the margin of current assets over current liabilities below a stated minimum.
6. The articles of incorporation require that an amount equivalent to a certain percentage of the par value of the greatest number of preferred shares outstanding at any one time is to be set aside semiannually out of surplus or net profit before dividends may be paid on common stock.
7. A loan agreement provides that dividends may only be paid after securing the consent of the lender.
8. An order or requirement of a regulatory agency having jurisdiction limits the right to declare or pay dividends.

It is further provided that the disclosure should consist of a description of the restriction, its source, and, wherever determinable, the amount and type of surplus restricted. The disclosure is ordinarily made in a footnote to the balance sheet or in the surplus section of that statement.[22]

The accountancy standard goes further than the legal code when the proposed source of dividends is nonrecurring income. Dividends from profits on sale of fixed assets, the receipts on life insurance policies after the death of the insured, and the like, are available for any kind of dividend, but, if material in amount, full disclosure should be given to the stockholders of the source of the dividend.

[21] *Accounting Series Release No. 35.*

[22] For an analysis of the procedures followed by many corporations see Bradley, 23 *Accounting Review* 385–390.

The Research Department of the American Institute of Accountants [23] has prepared the following reports on types of surplus restrictions:

While disclosure of most types of earned surplus restrictions was generally found in footnotes, the restrictions resulting because of the purchase of treasury stock were most often indicated on the balance sheet by means of a parenthetical comment in conjunction with the surplus item. Restrictions established by preferred stock agreements on the other hand were indicated in a footnote in the majority of cases but a few companies were noted which favored parenthetical notation on the balance sheet (e.g., Butler Bros.).

The needs of corporations for additional cash were reflected in the increased number of loan agreements; banks and insurance companies being the two principal sources of new funds.

| 1948 | 1947 | 1946 | |
|---|---|---|---|
| 183 | 146 | 110 | Bond indenture or loan agreement (Champion Paper & Fibre Co.; R. J. Reynolds Tobacco Co.) |
| 36 | 37 | 41 | Preferred stock (Willys-Overland Motors, Inc.) |
| 15 | 17 | 19 | Purchase of treasury stock (Houdaille Hershey Corp.) |
| 9 | 11 | 11 | Oil company pipe line earnings restricted by Elkins Act (Gulf Oil Co.) |
| 15 | 10 | .. | Restrictions established by certificate of incorporation |
| .. | 5 | .. | Indicated but nature not disclosed (International Paper Co.) |
| .. | 1 | .. | Trust indenture (Cities Service Co.) |
| .. | 1 | .. | Reserves required under bylaws of foreign companies (American Smelting & Refining Co.) |
| .. | 1 | .. | Reserved by board of directors for working capital (Cannon Mills Co.) |
| 4 | .. | .. | Dividends in arrears on preferred stock |

The Moxie Company showed an item "surplus available except for dividends on common stock" on the balance sheet in addition to separately designated amounts for "capital surplus" and "earned surplus."

*Availability of paid-in surplus.* The accountancy standard treats paid-in surplus in a manner similar to the other contributions of the stockholders, that is, subject to diminution only through the same sort of action and consent of stockholders as is required in any reorganization or recapitalization. As noted previously, this is somewhat different from the legal code in many states since a recent study indicates that thirty-six states allow cash dividends to be made from paid-in surplus.[24] Some of these thirty-six states require that stockholders, however, be informed of the source of the distribution if paid-in surplus is charged. Many of the state statutes read somewhat as follows: "A dividend is paid out of capital, if and so far as, the value of the assets of the corporation remaining after

[23] *Accounting Trends in Corporate Reports, 1949*, p. 82, and *Accounting Techniques Used in Published Corporate Annual Reports, 1949*, p. 95 (data combined and quoted by permission).

[24] Benninger, 21 *Accounting Review* 60.

such dividend is paid is not equal to the amount of the liabilities, including the par value of all outstanding par value stock and including the value of all outstanding non-par value stock, as determined at the time of its issue as a liability." [25] A small group of states have provisions to the effect that paid-in surplus is available for dividends to preferred stockholders only.

Comparatively little progress has been made in securing legislative adoption of the accountancy standard mentioned at the first of this section relating to dividends from paid-in surplus. Some time ago one authority predicted that the legal viewpoint would agree with the accounting thinking within a few years,[26] but this seems far from fulfillment at present.

The accountants' disapproval of cash and property dividends being charged to paid-in surplus (except in liquidation) stems largely from the fact that such dividends readily lend themselves to fraud and deception. While the situation can be partially cured by full disclosure if there is only one class of stock, more drastic treatment may be needed when there are several classes of stock. For instance, assume that a corporation issues at $50 per share preferred stock with a par or stated value of $1 per share, a liquidating value of $50 per share, and a redemption price of the same. The corporation, however, carries $1 to the legal capital and $49 to paid-in surplus legally available in many states for common stock dividends. Although the paid-in surplus has been legally created, the preferred stockholder has been misled as to the exact degree of protection to which his investment is legally entitled. In every real sense, the stock has been offered as a $50 rather than a $1 investment. The Securities and Exchange Commission has attempted to minimize this deceptive practice by requiring a footnote to the balance sheet indicating the aggregate liquidation value and also stating the opinion of the registrant's counsel as to the legality, from the standpoint of possible equitable remedies as well as statutory permission, of any use of the "so-called" surplus for common stock dividends.[27]

The accountancy standard does not object to a stock dividend being declared out of paid-in surplus.[28]

*Availability of donated surplus.* If donations from stockholders are credited to Paid-in Surplus as recommended by the present authors, the Donated Surplus account would be credited for the appraised valuation of fixed assets unconditionally donated by outsiders, such as city boards of trade and the like, and debited for any expenses caused by the acceptance of the gift. As unconditional gifts from outsiders are not contributed

[25] Public Laws of the State of Vermont, Sec. 5824.
[26] Kohler, 9 *Accounting Review* 255.
[27] *Accounting Series Release No. 9.*
[28] (1928) Wildman-Powell 198; (1936) Marple 165; (1937) Montgomery 608.

capital, the resulting surplus may be declared as dividends if proper disclosure is made of the source of the dividends.

If the title to the property is withheld until the corporation has fulfilled certain stipulations, there are two procedures available:

1. Record Asset when Title Passes. The rules of income tax procedure are: (a) Ignore depreciation until title passes.[29] (b) For the purpose of determining gain, the basis is the same as it would have been in the hands of the donor, or the last preceding owner by whom it was not received as a gift. For the purpose of determining loss, the basis is as so determined, or the fair or market value of the property at the time of the gift, whichever is the lower. All titles to property acquired by gift relate back to the time of the gift, even though the interest of him who takes title was, at the time of the gift, legal, equitable, vested, contingent, conditional, or otherwise.[30]

2. Record Asset when Donated. The procedure needed to have comparable production costs would (a) take up the market value of the property when possessed by debiting contingent asset accounts for the land and the other fixed assets and crediting the Reserve for Contingent Donation of Fixed Assets; (b) record periodic depreciation on the donated assets as an operating expense offset by credits to special reserves for depreciation; (c) debit the Reserve for Contingent Donation of Fixed Assets and credit Earned Surplus (if unusual items are debited and credited directly to Earned Surplus account) for the amount of the periodic depreciation; (d) charge moving costs, and the like, to the Reserve for Contingent Donation of Fixed Assets; and (e) when title is finally passed, close the contingent assets and special depreciation reserves into the ordinary accounts, and then close the Reserve for Contingent Donation of Fixed Assets into the Donated Surplus account.[31] The reserve is to be considered a valuation reserve in preparing a balance sheet.[32] After title passes, dividends may be declared from the donated surplus if proper disclosure is made of the source of the dividends.

*Availability of Reserve for Unrealized Appreciation (Revaluation Surplus).* Accountants in general have opposed the declaration of cash and property dividends which are to be charged to the Reserve for Unrealized Appreciation account (see preceding chapter). The basis for this opposition rests on the general feeling that unrealized appreciation is so closely akin to contributed capital that stockholders can too easily be misled as to the nature of the dividend. In addition, since by its very name this possible source is unrealized, accountants are reluctant to depart from the funda-

[29] *Frank Holton & Co.*, 10 B.T.A. 1317.
[30] *Regulations 111*, Section 29.113(a)(2)–1.
[31] Walton, 26 *Journal of Accountancy* 68; (1934) Finney, I, 258.
[32] (1933) Kester 361.

mental standard that dividends are supposed to come from profits, and the term "profit" presupposes realization. The laws of some states, such as California and Illinois, expressly prohibit cash dividends from revaluation surplus. Several other states allow stock dividends from such an account, or allow dividends on preferred stock only.[33] The statutory law on the subject is thus quite confused and no definite controlling opinion can be derived from a general review of the corporate acts.[34] Some accountants have stated that there is not the same objection to stock dividends from unrealized appreciation as in the case of cash dividends. This view has been criticized, however, on the ground that the result is no different from that obtained if the corporation sells stock to its present stockholders for cash and then returns cash to them, making a corresponding decrease in the revaluation surplus.[35] It is certain that in the case of a stock dividend, past creditors suffer no reduction in their rights, since the physical assets remain the same. From the standpoint of public and financial policy, however, the situation may be different. The present writers would not go so far as to state, as Kehl does, that "it is as objectionable to increase a corporation's capitalization upon the basis of uncertain asset values as it is to pay dividends out of such illusory funds," [36] yet the matter is of some import to the accountant.

While the profit available for dividends according to the accountancy standard must take into consideration estimated valuations (i.e., depreciation, depletion, bad debts, earned subscription income, etc.), such estimations usually affect the periodicity of the income rather than the total amount of the income, and their computations generally involve merely the application of ratios objectively obtained from the accounting records upon the figures from present actual transactions. Appreciation, on the other hand, involves at the beginning subjective values realizable only in the event of the sale of property held primarily for use.

*Operating deficit and dividends.* In regard to operating deficits and dividends there are two questions:

a. The first is whether dividends may be paid from subsequent profits despite the existence on the books of an operating deficit.

b. In estimating the profit available for dividends, must the deficits of a past year (or years) be carried over to following years, or may a past operating loss be removed through charging it against some type of paid-in surplus, in order that the deficit may have no effect on the showing of profits available for dividends in subsequent years?

Both of these questions have been discussed at length by accountants

[33] Briggs, 8 *Accounting Review* 130–144.
[34] (1941) Kehl 100.
[35] Mason, 7 *Accounting Review* 63; Kerrigan, 12 *Accounting Review* 238, 245–257.
[36] (1941) Kehl 102.

and legal authorities. In England, the general rule laid down by the courts has been to allow dividends out of profits of the current accounting period despite a deficit,[37] but this has been subject to some exceptions. In this country, in the absence of statutory provision, the courts have generally laid down an opposite view; e.g., "the earned profits, therefore, reduced the impairment, and the declaration of the dividend again impaired the capital to the extent of the dividend declared." [38] Many accountants have expressed their convictions on the matter in terms such as the following: "It would appear to be sound economically that, the capital having been diminished by losses, profits should be withheld from distribution as dividends until the loss has been made good, in order that the original status of the stockholder may be restored." [39] An opposite opinion, however, has been stated by some accounting authorities who reason that the matter is one of law and public policy — not accounting.[40] The present writers agree that whether a dividend is permissible is a matter to be determined by examination of the applicable state statute; however, from the standpoint of the interpretation of a dividend, it is a highly significant matter that the stockholders not be misled into thinking that the dividends are coming "out of accumulated profits" when in fact there is a past operating deficit.[41]

The question of the source of dividend payment has ceased to be solely a theoretical matter, for most accountants agree that contributed capital should not be paid out under the guise of ordinary dividends. The whole question, however, could be clarified in the legal realm in order to make it unlawful to return contributed capital to the stockholders just because it is carried on the balance sheet as some variety of "surplus." Certain states have already passed such laws.

Accountants are occasionally confronted with the second question posed at the beginning of this section; namely, the absorption of deficits in paid-in surplus. These transactions are now often called "quasi-reorganizations." Most accountants agree that there are cases where by proper corporate action a deficit may be absorbed through a reduction of par (or the stated value of no-par) stock, or by transfer to paid-in surplus. As indicated in Chapter 4, however, the earned surplus thereafter should be "dated." In other words, if the corporation has "started over," the balance sheet should indicate the fact clearly.[42] Some authorities point out, however, that, according to several of the state statutes, deficits arising from opera-

[37] Weiner, 28 *Columbia Law Review* 1046.
[38] *Branch v. Kaiser*, 140 Atl. 500.
[39] (1929) Hurdman, *Proceedings, International Congress on Accounting*, p. 587; see also Briggs, 9 *Accounting Review* 236; Schlatter, 35 *Journal of Accountancy* 172; Floyd, 35 *Journal of Accountancy* 390.
[40] Husband, 13 *Accounting Review* 249.
[41] For an extended analysis of this see McCormick, 88 *Journal of Accountancy* 196–207.
[42] Rorem, 12 *Accounting Review* 137; Werntz, 14 *Accounting Review* 118.

tions cannot be charged to paid-in surplus because actually the entry transfers paid-in surplus to earned surplus and thus at a later date (if earnings are sufficient to make up for the previous transfer) leaves a balance of paid-in surplus in the Earned Surplus account which may become available for dividends to common stockholders.[43] Since this matter is discussed at length in Chapter 4, it will not be treated further at this point.

*Depletion.* Accountants in this country have generally supported the famous English court decision of *Lee v. Neuchatel Asphalt Company, Ltd.*,[44] and hold that "a corporation formed to work a [single piece of] wasting property, such as a mine, a quarry, an oil well, a tract of timber, a patent, or a lease for a term of years, need pay no attention to depletion and that in such cases dividends will be paid partly from profits and partly from capital." [45] The idea that the income from wasting assets is computed before depletion is the reason why some formulas for valuing wasting assets assume that a sinking fund will be established out of income. When dividends of an extractive industry corporation exceed the accumulated net income after deducting depletion, this excess should be debited to the Capital Returned to Stockholders account, which account should be shown as a deduction from the Capital Stock account on the balance sheet.[46] Returning contributed capital to stockholders because depletion is ignored as an expense is sometimes spoken of as declaring a dividend out of the Reserve for Depletion. This concept is faulty, however, because the Reserve for Depletion is a valuation reserve and a dividend cannot logically be declared out of a negative asset account.

In this connection, the Treasury Department has ruled: "A distribution from a depletion or a depreciation reserve based upon the cost or other basis of the property will not be considered as having been paid out of earnings or profits, but the amount thereof shall be applied and reduce the cost or other basis of the stock upon which declared. . . . No distribution, however, can be made from such a reserve until all the earnings or profits of the corporation have first been distributed." [47]

**Directors' discretion as to dividends.** The question of whether a dividend is to be declared is in practically all instances within the discretion of the board of directors who are the duly elected managers of the corporation. In one case, for example, the court stated that the action of the directors in refusing to declare a dividend is reviewable by the court as a matter

[43] Payne, 10 *Accounting Review* 89.
[44] L.R. 41 Ch. Div. 1 (1889).
[45] Schlatter, 35 *Journal of Accountancy* 180–181; see also (1927) Hatfield 265–268.
[46] (1938) Paton 520; (1933) Kester 613; (1938) Sanders-Hatfield-Moore 88; (1944) Sunley-Carter 192; (1938) Taylor-Miller 239.
[47] Regulations 111, Section 29.115–6.

of equity, "but it will be set aside only in case of bad faith or when arbitrary, or manifestly erroneous, or such as to constitute an abuse or disregard of official duty." [48] Another court upheld the directors in their refusal to declare a 200 per cent dividend on a legal capital of $5,200 and an accumulated surplus of $21,780.09. The company had only $8,000 cash on hand, and a 200 per cent cash dividend would have taken $10,400 out of the bank account. This court reasoned that it was not sufficient to allege a set of figures, or a ratio of authorized capital to earned surplus, and then pass the burden upon the court of fixing a dividend; the primary duty is on the directors.[49]

*Dodge v. Ford Motor Company* [50] is a very interesting case on the subject of the discretionary power of directors to declare dividends. In this case the Ford Motor Company, a Michigan corporation, had an earned surplus of almost 112 million dollars, some 54 million of cash, and capital stock of $2,000,000. The profit prospects were excellent. In October 1915, a special dividend had been declared in addition to a monthly dividend of 5% upon the capital stock. No special dividend was declared in 1916. Dodge, and other minority stockholders, suggested that special dividends were in order, in view of the large earned surplus and cash. Their request was met with action of the directors looking to extensive additions and improvements in the plant and of transports for ore, building of smelters, etc. This program, it was found by the court, was not primarily for increasing the business and profits of the corporation, but, as expressed by Henry Ford: "My ambition is to employ still more men, to spread the benefits of this industrial system to the greatest possible number, and to help them build up their lives and their homes. To do this we are putting the greatest share of our profits back in the business." Dodge, on behalf of the minority stockholders, brought suit to force distribution of a large dividend. In a judgment ordering the company to pay a dividend of $19,000,000, the court said:

> Here Mr. Ford was using corporate funds for his idea of philanthropy. A business corporation is organized and carried on primarily for the benefit of the stockholders. The powers of the directors are to be employed for that end. The discretion of the directors is to be exercised in the choice of means to attain that end, and does not extend to a change in the end itself, to the reduction of profits, or to the nondistribution of profits among stockholders in order to devote them to other purposes.

It should be noted that the decision in this case is an exception to the general rule. Courts do not enforce judgments against directors to declare dividends as long as good faith is present.[51] The discretion of the directors

[48] *Pardee v. Harewood Electric Co.*, 262 Pa. 68.
[49] *Hopkins v. Union Canvas Goods Company*, 158 Atl. 301.
[50] 204 Mich. 459.
[51] (1941) Kehl 160–165.

has been held to extend to borrowing money to pay dividends when accumulated profits have been tied up in fixed assets.[52] In addition, directors may use the net profits in improving fixed properties instead of declaring dividends on noncumulative preferred stock.[53]

**Dividend dates.** All dividends have four significant dates associated with them: (1) the date of declaration, (2) the date the stockholders' ledger is closed to determine the identity of the stockholders who will receive the dividends, (3) the date of payment, and (4) the date the dividend is held to be income for tax purposes.

*Date of declaration.* The fundamental rule in regard to a cash dividend is that if the declaration is equitably and formally determined, the relation of debtor and creditor is thereby established between the corporation and stockholders. This is the prevailing conclusion running through the adjudicated law on the subject. One authority [54] has stated that the following conditions do not justify the rescission of dividends after the relationship of debtor and creditor between the corporation and stockholder has been created:

a. Declaration of dividends with the provision that such dividends were to be payable at will of the directors, the stockholders being credited with their prorata amounts. Later, directors made a resolution to take these amounts from the accounts of the stockholders and to return them to earned surplus, the excuse offered by the board being that the money had been invested in improvements and that it would be unwise to pay a cash dividend at the time.

b. Failure to set aside a specific fund.

c. Insolvency of the corporation occurring before payment of the dividends made no difference in the obligation of the company to carry out its dividend declaration, and gave the concern no right to rescind the unpaid dividend debt.

The following situations do justify the rescission of dividends: [55]

a. If a board of directors declares a cash dividend, and at the time the declaration is made no profits are available to divide, and if public announcement of the declaration should be made, it may be that the right to reconsider and rescind would not be denied. The directors may recall their ultra vires act. They would not be under any obligation to consummate an illegal act. This attitude is based on the principle that the legal capital must not be impaired by the payment of dividends.

b. If a dividend has been declared when there is no earned surplus, it may be rescinded by the corporation even though the stockholders have received the distribution. In one case, the directors, under a misapprehension as to their powers, declared and paid a dividend based upon unearned insurance premiums which they thought were profits, but which really were liabilities of the corporation. In a suit by the creditors of the company, it was held that this dividend could be reclaimed

[52] *Williams v. Western Union Telegraph Co.*, 93 N.Y. 162.
[53] *Barclay v. Wabash Ry.*, 280 U.S. 197.
[54] Briggs, 7 *Accounting Review* 234 (quoted by permission).
[55] Briggs, 7 *Accounting Review* 236 (quoted by permission).

by the directors. This decision is also based on the principle that the legal capital must not be impaired by the payment of dividends.[56]

Dividends issued in the stock of the same corporation which declares the dividend may be rescinded at any time prior to the actual issuance of the stock.[57] The date of declaration of a dividend is vitally important in accounting for estates, since dividends declared prior to death of the testator are often considered as part of the corpus of the estate whereas dividends declared after the death of the testator may be income items.

*Date of identification of distributees.* Dividends may be, and usually are, declared payable to stockholders of record as of some future date so that the transfers of the shares in the process of being traded on the stock exchange may be recorded on the books of the corporation. Dividends may not be declared so that the date of identification of distributees is earlier than the date of declaration. Between these two dates, shares are usually sold "with dividends." If dividends are declared in one accounting period payable to stockholders of record at a date early in the ensuing accounting period, the dividends should be shown as current items on the balance sheets prepared during the interim.[58]

*Date of payment.* The dividend notice should give the date of payment of the dividends. The date of payment is important from an income tax point of view for each distribution is held to be made out of earnings or profits to the extent thereof, and from the most recently accumulated earnings or profits.[59]

*Date dividend is taxable.* Regulations 111, Section 29, 115–1 reads: "A taxable distribution made by a corporation to its shareholders shall be included in the gross income of the distributees when the cash or other property is unqualifiedly made subject to their demands." This rule, which makes dividends taxable to the recipient on the date of payment instead of the date of declaration, or recorded date, has been supported by the Supreme Court for cash basis taxpayers.[60] A recent decision has implied that the same rule will be followed for accrual basis taxpayers; [61] the same opinion holds that a uniform federal rule rather than the decisions of state courts is to determine the matter as to when a dividend becomes a debt of the corporation. Some of the circuit courts of appeal had ruled previously that the state laws governed the date determination.[62]

[56] *Lexington Life, Fire and Marine Insurance Co. v. Page*, 56 Ky. 412.
[57] *Terry v. Eagle Lock Co.*, 47 Conn. 141.
[58] Chamberlain, 13 *Accounting Review* 86–88.
[59] Regulations 111, Section 29.115–2.
[60] *Avery v. Commissioner*, 292 U.S. 210, 214; *Mason v. Routzahn*, 275 U.S. 175.
[61] *Putnam Estate v. Commissioner*, 65 Sup. Ct. 811, reversing 144 Fed. (2nd) 756. For an analysis of this controversy see Tyler, 80 *Journal of Accountancy* 353–357.
[62] *Helvering v. McGlues Estate*, 119 Fed. (2nd) 167; *Commissioner v. Cohen*, 121 Fed. (2nd) 348.

**Dividends from paid-in surplus.** The fact that more and more legal restrictions are being placed around dividends from paid-in surplus has already been presented. The accountant's disapproval of such dividends centers in the fact that they represent a return of contributed capital rather than income and to call them dividends is often misleading. The distribution of paid-in surplus to the stockholders offers no accounting problems to the corporations. If there is only one class of stock, distributees should credit the receipt of dividends declared out of paid-in surplus to their investment accounts. If there are several classes of stock, the receipts would be a partial liquidating dividend to a given stockholder only if the declaration was charged to the surplus contributed by his class of stock.

For income tax purposes, a statement in the resolution providing that the cash and property dividends shall be from paid-in surplus does not render the dividend nontaxable to the recipients where there are sufficient available profits.[63]

**Dividends from proceeds of life insurance policies.** The excess of the receipts from life insurance policies over their book value at the death of the insured is income available for dividends. While these receipts are tax-free to the corporation,[64] except where the policy was originally acquired for a consideration, dividends paid by the corporation from such receipts are taxable to the stockholders.[65]

**Dividends from surplus at acquisition.** The subsidiary's earned surplus is eliminated when a consolidated balance sheet of a parent company and its fully-owned subsidiary is prepared. The holding company, therefore, should treat all cash and property dividends declared out of the subsidiary's surplus at date of acquisition as a reduction of the investment account in cases where the subsidiary stock is carried either at its book value or at a cost higher than its book value, and to paid-in surplus in cases where the subsidiary company stock is carried at a cost which is lower than its book value.[66] Dividends paid out of surplus earned before the investor purchased his holdings constitute taxable income to him.[67] When stock is purchased "with dividends," the purchased dividends should be treated as a return of investment both for accounting and income tax purposes.[68]

**Preferred dividends during construction of fixed assets.** Whether it is permissible to capitalize preferred dividends paid during the fixed asset construction period when the proceeds from the sale of this preferred stock

[63] *Leland et al. v. Commissioner*, 50 Fed. (2nd) 523.
[64] Regulations 111, Section 29.22(b)(1)-1.
[65] I.T. 2131, IV-1 C.B. 90.
[66] (1937) Montgomery 579; (1938) Sanders-Hatfield-Moore 70.
[67] *Edward H. Moore*, 22 B.T.A. 366.
[68] *S. Silberman & Sons v. Commissioner*, 76 Fed. (2nd) 360; (1938) Taylor-Miller 137; Accounting Questions Section, 54 *Journal of Accountancy* 71–72.

were definitely used to defray a portion of the cost of the construction program is an unsettled question. The replies in the Accounting Questions Section of the *Journal of Accountancy* were two negative to one affirmative.[69] The present writers believe, although no published rulings are available, that the U.S. Treasury Department would refuse to allow any amortized "dividend cost" to be taken as a taxable deduction in the depreciation allowance.

**Dividends of holding companies.** As consolidated statements have practically no legal status and as dividends do not accrue, the holding company's income available for dividends is its individual earnings when its investments in subsidiaries are carried at cost. The income of subsidiaries is not available for dividend declarations by the holding company unless first declared as dividends by the subsidiaries.[70]

**Guaranteed dividends.** Dividends on the stocks of affiliated companies are sometimes guaranteed by the parent. These guaranteed dividends affect the records of three parties:

1. Owner of guaranteed stock. The dividends on his guaranteed stock are income whether paid by the subsidiary or by the guarantor.

2. Issuer of guaranteed stock. The subsidiary is not liable for the dividend until it is declared. If a passed dividend is paid by the guarantor, it would, upon subsequent declaration, be paid to the guarantor instead of to the stockholder.

3. Guarantor of stock. Guaranteed stock would appear under the heading "Minority Interests" on the consolidated balance sheet. In the case of guaranteed stocks of a subsidiary, there is an offsetting contingent asset in the form of the value of the rights which would be secured in the event that the guarantor had to pay the dividends. As this contingent asset is not recorded by the guarantor, the contingent liability should be shown either as a footnote to, or as a parenthetical clause in, the consolidated balance sheet. Guaranteed dividends actually paid by the holding company will not appear on the consolidated balance sheet as they would be eliminated first against the minority interest's share of the subsidiary's surplus (such elimination may not cause or increase a deficit pertaining to the minority interest), and if such surplus is insufficient, against the consolidated surplus.[71]

**Issuer's entries for stock dividends.** When stock dividends are declared, the Stock Dividends to Be Issued account is credited; pending the issue of the shares this account should be shown on the balance sheet immediately below the outstanding capital stock. Alternative methods are to disclose

[69] 66 *Journal of Accountancy* 117–119.
[70] A leading case is *Cintas v. Amer. Car & Fdy. Co.*, 131 N.J. Eq. 419.
[71] (1948) Newlove 75.

the unissued stock dividends by (a) a notation in the proprietorship section, (b) a notation in a footnote to the proprietorship section, or (c) by showing the item under the capital stock caption with the money value of the unissued stock certificates going into the total shown for capital stock.[72] If the stock has a par value, and if the market price of the stock is not allowed to influence the entry, the monetary amount placed opposite the entry is the product of the number of shares multiplied by the par value per share. If the market value of the shares issued in the stock dividend is allowed to influence the entry (see discussion below), the entry is made as shown in the following example:

*Example*

The X Corporation has 500 shares of common stock outstanding, par $10 per share. A ten per cent stock dividend is declared and issued at a time when the current market price of the stock is $14 per share. Journalize, if the 500 shares were originally sold at par.

| | | |
|---|---|---|
| Earned Surplus (50 shares × $14) | $700 | |
| Capital Stock (50 shares × $10) | | $500 |
| Paid-in Surplus (Miscellaneous) | | 200 |

If the shares issued have no par, but do have a stated value, the issuer's entry is prepared in a manner similar to the par value situation described above. Shares having neither par nor stated value should be recorded either on the basis (a) of the average (per share) consideration received or (b) the present market price of the shares issued in connection with the stock dividend.

As a matter of interest, several alternate methods of recording stock dividends have been recommended by accountants in the past two or three decades. These alternate procedures are summarized below:[73]

1. The issuance of the additional stock described as a stock dividend, without the transfer to Capital Stock account of any sum whatsoever, either from paid-in surplus, from earnings, or from earned surplus.[74] (Technically, this would be a "stock split.")

2. The transfer to Capital Stock account from paid-in surplus of a nominal sum per share issued.

3. The transfer to Capital Stock account from paid-in surplus of an amount per share issued equal to the theretofore stated value or par value of the stock per share.[75]

[72] Kerrigan, 12 *Accounting Review* 384–385; see Blough, 88 *Journal of Accountancy* 84–85, for a complete discussion.

[73] Hoxsey, 50 *Journal of Accountancy* 265–266.

[74] Recommended for no-par shares without stated value — Brundage, 41 *Journal of Accountancy* 254; (1928) Wildman-Powell 192.

[75] Recommended for no-par shares with stated value — (1927) Krebs 805 (charges Earned Surplus after Paid-in Surplus is exhausted).

4. The transfer to Capital Stock account from earned surplus of a nominal amount per share issued.

5. The transfer to Capital Stock account from earned surplus of an amount per share issued equal to the theretofore stated value or par value of the stock per share.[76]

6. The transfer to Capital Stock account and/or Paid-in Surplus account from earned surplus of an amount per share issued equal to the theretofore stated value or par value of the stock per share, plus the theretofore paid-in surplus per share.[77]

7. Particularly with companies having large uncapitalized tangible or intangible assets, the transfer to Capital Stock account and/or Paid-in Surplus account from earned surplus of an amount per share issued greater than the sum of the theretofore capital per share plus paid-in surplus per share and less than the market value per share.

8. The transfer to Capital Stock account and/or Paid-in Surplus account from earned surplus of the theretofore entire book value per share, including earned surplus; (note — if earned surplus were equal to contributed capital, this method would exhaust earned surplus upon payment of a 50 per cent stock dividend).

9. In a few cases a stock split may be partially combined with a stock dividend. For instance, in a footnote to the report of one company it was stated:

> On March 27, 1947, a further Certificate of Amendment of the Certificate of Incorporation was filed which provided that the authorized capital stock of the company shall thenceforth consist of 1,650,000 shares of $10 par value common stock. The 437,524 shares of $20 par value common stock issued and outstanding (after the elimination of the 8,726 shares) were increased to a total of 1,531,334 shares of $10 par value common stock, by changing each share of $20 par value common stock into 3½ shares of $10 par value common stock. The aggregate increase in the par value of the issued and outstanding shares of $20 par value common stock amounting to $6,562,860 was credited to the Capital Stock account and charged against paid-in surplus then existing in the amount of $1,445,089.83. The balance of $5,117,770.17 was charged against earned surplus.

In 1941, the Committee on Accounting Procedure of the American Institute of Accountants issued its *Research Bulletin No. 11* on this subject which laid down a number of desirable corporate practices as follows:

1. The board of directors must assume the responsibility of determining the amount of earned surplus to be capitalized, but there is a "proper

[76] Recommended for no-par shares with stated value — Brundage, 41 *Journal of Accountancy* 254; (1928) Wildman-Powell 192–193; Michigan Corporation Law (1931), Section 22; (1927) Montgomery 647 (as minimum limit); Johnson, A. W., *Principles of Accounting* (New York: Farrar and Rinehart, Inc., 1937), p. 351.

[77] Recommended for no-par shares with stated value — Hoxsey, 50 *Journal of Accountancy* 267–268; (1932) Paton 941–943 (as minimum limit).

corporate policy" which should be observed by the board in making its decision.

2. In the case of frequent stock dividends, i.e., those declared quarterly or annually, the dollar sum of earned surplus transferred to capital stock should not exceed the amount of the current income. This is to prevent the stockholders from being misled. "Current income" is the net income of the period in which the stock dividend is declared or the preceding "small number of fiscal periods." Any cash dividends declared should also be considered in determining the amount capitalized by means of stock dividends.

3. The amount of earned surplus transferred to capital stock on a per share basis should bear an "appropriate relationship to the existing capitalization per share." The term "capitalization" is interpreted to mean both par or stated values as well as paid-in surplus.

4. In deciding how many shares are to be issued as a stock dividend the directors "should take into consideration a fair market value per share for the increased number of shares to be outstanding after the stock dividend, and where such fair market value per share is substantially in excess of the amount per share of the combined capital stock and capital surplus accounts before the stock dividend, they should fix the number of dividend shares so that the amount charged to earned surplus per share will have a reasonable relationship to such fair market value." This standard would probably be difficult to follow in cases of closely held corporations.

5. In case "the amount of earned surplus capitalized per share of dividend stock exceeds its par or stated value, the excess should be credited to paid-in surplus."

6. In all cases of stock dividends, the stockholders should be informed as to the amount of earned surplus transferred per share as well as the total amount involved. "In addition, the corporation should inform the stockholder as to the percentage by which the interest which he had in the corporation before the issuance of the stock dividend will be reduced if he should decide to dispose of his dividend shares."

On October 7, 1943, the New York Stock Exchange issued a statement approving the standards set forth in *Research Bulletin No. 11* and indicating that listed corporations would be expected to follow them in the future.[78]

A similar situation arises in connection with the corporation's entries for the sale of stock through the issuance of stock rights. Some accountants transfer from earned surplus to paid-in surplus the total parity value of the rights actually exercised, computed as of date of issuance of the rights.[79]

[78] For a criticism of *Bulletin No. 11* see Bordner, *The Arthur Andersen Chronicle*, July 1942, p. 139.

[79] Kerrigan, 12 *Accounting Review* 380–381.

Most authorities, however, insist that no such transfer need be made for stock sold by means of rights.[80]

*Rights of preferred stockholders to stock dividends.* If the outstanding preferred stock is nonparticipating, a common stock dividend payable only on the common stock may be declared, but a preferred (same as outstanding) stock dividend payable only on the common stock may not be declared as it would disturb the old preferred shareholders' prior rights to dividends and to assets in liquidation; a dividend payable in second preferred stock could, however, be declared on the common stock without giving a like dividend to the old preferred stockholders. Fully participating preferred stockholders must be given their share of all stock dividends. The exact status of partly participating shares can be determined only by a careful analysis of the specific contracts involved.

*Example of stock dividend notice to shareholders.* In order to indicate the type of information which should be supplied to stockholders (after the declaration of a stock dividend) the following paragraphs are adapted from an actual notice. The student should note the method followed in handling scrip certificates and the amount of earned surplus transferred to capital accounts:

To Stockholders of the Company:

On September 17, 1948, the Board of Directors of the Company declared, as an extra dividend upon its outstanding Capital Stock, a stock dividend of 1 share of such stock for each 40 shares outstanding, payable November 15, 1948, to stockholders of record September 27, 1948.

This dividend is being paid in stock rather than in cash because of the desirability of conserving the cash resources of the Company in order to meet the large capital expenditures required to supply the unprecedented demand for our products.

Pursuant to this dividend, some stockholders are entitled to receive full shares of Capital Stock, others are entitled to receive Scrip Certificates for fractional shares of Capital Stock, and others are entitled to receive both full shares of Capital Stock and Scrip Certificates for fractional shares. The Capital Stock Certificate or Scrip Certificate, or both, enclosed with this letter represent your participation in this extra dividend.

The receipt by a stockholder of a stock dividend does not change the percentage of his interest in the Company. However, a sale by a stockholder of the stock he receives as a dividend will reduce the percentage of his interest in the Company.

*No fractional shares of Capital Stock will be issued* and a stockholder can only realize the value of his Scrip Certificate by combining it with other Scrip Certificates for the purpose of exchanging them for one or more full shares, or by selling the Scrip Certificate.

In order to assist holders of Scrip Certificates in combining their fractional Scrip Certificates into full shares (or in selling them), the Company has made arrangements with Central Hanover Bank & Trust Company, 70 Broadway, New York 15, New York, to buy and sell such certificates for the risk and account

[80] (1943) Paton 1004.

of such holders and at no expense to them. For your convenience, we are enclosing herewith a form of letter of transmittal, together with an envelope addressed to the Bank, for your use in giving directions to the Bank.

It will be noted that the Scrip Certificates have been prepared in units of 200ths of a share rather than 40ths of a share. For example, the owner of one share of stock, entitled to a stock dividend of 1/40th of a share, will receive a Scrip Certificate for 5/200ths of a share, and it will be necessary for him to combine it with other Scrip Certificates aggregating a total of 195/200ths of a share in order to entitle him to one full share of stock. Similarly, the holder of 20 shares of stock will receive a Scrip Certificate for 100/200ths of a share, and it will be necessary for him to combine his Scrip Certificate with other Scrip Certificates aggregating 100/200ths of a share in order to entitle him to one full share of stock.

*Scrip Certificates have no voting or dividend rights.*

The full shares of Capital Stock to be issued pursuant to the surrender of Scrip Certificates will have no voting or dividend rights until such Scrip Certificates are surrendered and stock certificates are issued in exchange. However, after such stock certificates have been issued, the stock represented thereby will have voting rights and will participate in dividends thereafter declared on the Capital Stock of the Company.

*It is, therefore, in the interest of holders of Scrip Certificates to act promptly to combine their Scrip Certificates with other Scrip Certificates to make up full shares.*

*The privilege of exchanging Scrip Certificates for full share certificates of Capital Stock will expire on November 15, 1950.*

As soon as possible after November 15, 1950, the full shares of Capital Stock represented by the then outstanding Scrip Certificates will be sold at public or private sale, at the market price, for the account of the holders of such Scrip Certificates and such holders will then be entitled to receive their respective prorata shares of the net proceeds of such sale upon surrender of their Scrip Certificates to the Central Hanover Bank & Trust Company, 70 Broadway, New York 15, New York, on or before November 15, 1954.

*After November 15, 1954, all Scrip Certificates will be void and of no value whatsoever.*

*Changes in Capital and Surplus*

After giving consideration to the book value of the Company's Capital Stock and its average market price during the year prior to September 17, 1948, the date of the declaration of this stock dividend, and to other factors, the Board of Directors has ordered that for each share of Capital Stock issued pursuant to this dividend, the amount of $58 be transferred from the Earned Surplus account, of which $25, or the par value of such share, will be added to the Capital Stock account, and $33 will be added to the Capital Surplus account.

*Federal Income Taxes*

In the opinion of tax counsel for the Company, this stock dividend is not subject to federal income tax. Gain or loss subject to federal income tax may be realized on sale or other taxable disposition of the stock, or of the scrip, received as a dividend. The dividend stock or scrip will be deemed to have a basis for computing gain or loss equal to 1/41 or 2.439% of the cost or other basis of the stock on which it was issued. Correspondingly, the basis for computing gain or loss with respect to such old stock is reduced to 40/41 or 97.561% of its former basis. The

dividend stock or scrip is deemed to have been acquired at the same time as the stock on which it was issued.

*Mailing of Stock Certificates*

Full share stock certificates issued in exchange for surrendered Scrip Certificates will be mailed to stockholders by the Company rather than by the Bank. The Company anticipates that the stock certificate will be mailed to the stockholder approximately one week after the Bank receives payment for any additional Scrip Certificates purchased by the Bank for his account.

Each stockholder receiving a Scrip Certificate should promptly send the certificate, with the enclosed letter of transmittal filled out and signed, to Central Hanover Bank and Trust Company, 70 Broadway, New York 15, New York.

**Reversal of stock dividend.** The question is sometimes raised as to the possibility of reversing the entry made for a stock dividend if at some future date the corporation (because of losses) begins to have a debit balance in its Earned Surplus account. Of course, this possible reversal would be easier to accomplish if no-par value stock were outstanding. The writers take the position that no reversal should be made; if accumulated capital is made part of the dedicated capital the corporation has made a representation to the interested groups which would preclude the later reversing of the entry.[81]

**Dividends in property which has appreciated in value.** In some cases the directors of a corporation may declare a property dividend in assets which have a current market price greatly in excess of the cost of the property to the corporation. If this happens, the tax question arises as to whether the declaring corporation must report a realized gain on the transaction, at least for tax purposes. As a general rule it is well established that the declaring corporation simply charges its Earned Surplus account for the cost of the asset distributed and credits the appropriate property account. After distribution, however, the assets have an income tax basis to the stockholders consisting of the fair market value of the assets at the time of effective or constructive receipt by the owners of the corporation.

While the general rule as stated above is clear, it is subject to at least one possible exception. In one case the P Corporation owned the stock of the S Company which in turn owned about 20 per cent of the stock of the R Company. The stockholders of the R Company voted to sell its assets, but before all of them could be sold, D, the largest stockholder of R, asked that further selling be stopped until better prices could be obtained (D promised to protect the other owners of R Company from any loss because of the delay). A few weeks later, Company S declared as a property dividend the stock of the R Company. After about four more weeks had passed by, Companies P and D agreed upon a reasonable price for the R stock;

[81] Baumann, 80 *Journal of Accountancy* 229.

subsequently, this stock was sold to D. The court held that Company S realized a gain on the sale of the stock, measured by the difference between cost basis to Company S and the purchase amount received by the P Corporation.[82] The court reasoned that since there was no legitimate business motive associated with the transactions, the possible tax avoidance involved should not be allowed. As stated by the court:

> The doctrine of *Gregory v. Helvering*, 293 U.S. 465, which we here hold to be controlling, is not limited to cases of corporate reorganizations. It has a much wider scope; it means that in construing words of a tax statute which describe commercial or industrial transactions we are to understand them to refer to transactions entered upon for commercial or industrial purposes and not to include transactions entered upon for no other motive but to escape taxation. Finally, it is plain that the excuse is not valid that the taxpayer declared the dividend in order to avoid the "withholding tax" imposed by Section 102 of the Revenue Act. Had it made the sale in its own name, it could have escaped that tax quite as safely by declaring the proceeds as a dividend as it did by declaring the shares themselves.

[82] *Commissioner v. Transport Trading*, CCA-(2), No. 175, July 11, 1949.

# CHAPTER 7

## Mathematical Aspects of Capitalization and Amortization

**Need for mathematical simplicity.** Since the purpose of this volume is to develop the field of financial accounting rather than that of mathematics of finance, the material in this chapter is presented so as to avoid all unnecessary formulas. The use of special formulas will expedite the mathematical computations if the formulas are known. Accountants, however, seldom use the special formulas, so this volume stresses the basic equations which all accountants should be able to use without looking up any formulas.

Most of the mathematical difficulties found in evaluations based upon compound interest are caused by differences between the payment period and the interest (or conversion) period. Unless information to the contrary is available, these periods are assumed equal and one year in length, the interest rate of $i$ per cent is effective on an annual basis and there are $n$ annual periods involved in the evaluations. The following symbols are used when the periods are not one year in length:

$m$ = The number of times interest is compounded during a year
$p$ = The number of times the payment period is contained in a year
$k$ = The number of years in a payment period
$j$ = The nominal interest rate per annum

Obviously, a given evaluation may involve either $p$ or $k$, or the payment period may be exactly one year.

There are 54 evaluations of annuities certain based upon annual interest periods, as shown in the table on page 205.

For most of these evaluations, except the very simplest, mathematicians have worked out more than one formula. However, complete sets of formulas are seldom given as the authors of books on the mathematics of finance assume that their readers can "slide" from one formula to another; most businessmen cannot handle the algebra involved. In this volume the authors avoid all these formula complexities by converting any nominal interest rate into an effective interest rate per payment period before using any evaluation formula. This technique reduces the formulas that must be remembered from 54 to 6. The simplification of formulas is made even more important because the 6 formulas are composed of combinations of only 4 mathematical factors.

In order that the accuracy of the evaluations may be verified, the illustrations of actuarial mathematics given in this volume have a very small

| | Ordinary Annuity | | Annuity Due | | Present Worth of Deferred Annuities | | |
|---|---|---|---|---|---|---|---|
| | Amount | Present Worth | Amount | Present Worth | Ordinary Annuity | Annuity Due | Total |
| Payments once a year: | | | | | | | |
| At effective interest rate . | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| At nominal interest rate . | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| Payments $p$ times a year: | | | | | | | |
| At effective interest rate . | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| At nominal interest rate: | | | | | | | |
| General case . . . . | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| When $m/p$ is integer . | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| When $p/m$ is integer . | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| When $m = p$ . . . . | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| Payments once in $k$ years: | | | | | | | |
| At effective interest rate . | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| At nominal interest rate . | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| | | | | | | Total | 54 |

number of payments. The evaluation procedure, however, is the one that should be used with cases having the usual number of payments. The proof of accuracy for each illustration is important as it shows the journal entries involved.

**Single payment at specified date.** A single payment at a specified date may cause two mathematical calculations: (1) the computation of its present worth as of now, and (2) the determination of its "amount" or final value as of a date subsequent to the date of payment if the principal is placed at compound interest upon its receipt. Besides the symbols given above, the following symbols are universally used:

$s$ = Amount that a principal of \$1 will amount to at compound interest
$a$ = Present worth of a principal of \$1 due in the future
$p$ = The number of times a fractional part of a year involved in an evaluation is contained in a year (e.g., if the time is two months, $p = 6$)

The equations for a single payment due at a later date are as follows:

$$s = \begin{cases} (1+i)^n \text{ yearly rate } i \text{ for } n \text{ years} \\ (1+j/m)^{mn} \text{ nominal rate } j \text{ compounded } m \text{ times per year for } n \text{ years} \\ (1+i)^{1/p} \text{ yearly rate } i \text{ for } (1/p) \text{ part of a year} \\ (1+j/m)^{m/p} \text{ nominal rate } j \text{ compounded } m \text{ times per year for } (1/p) \text{ part of a year} \end{cases}$$

Note that all of these are of the form

$$s = (1 + r)^t$$

where $r$ is the rate per interest period and $t$ is the number (integral or fractional) of interest periods.

The formulas for present worth are simply the reciprocals of the corresponding formulas for $s$ given on page 205. Thus, if the yearly rate is $i$ and the time is $n$ years

$$a = (1 + i)^{-n} = 1/(1 + i)^n$$

and similarly for the other cases. Many texts use the notation $v = (1 + i)^{-1}$, and hence, $v^n = (1 + i)^{-n}$.

In order to eliminate the task of raising $(1 + i)$ and $(1 + j/m)$ to algebraic powers, interest tables are published in the following forms:

AMOUNT OF 1

$s = (1 + i)^n$

| $n$ | 2% | 2¼% | 2½% |
|---|---|---|---|
| 1 | 1.0200 0000 | 1.0225 0000 | 1.0250 0000 |
| 2 | 1.0404 0000 | 1.0455 0625 | 1.0506 2500 |
| 3 | 1.0612 0800 | 1.0690 3014 | 1.0768 9063 |
| 4 | 1.0824 3216 | 1.0930 8332 | 1.1038 1289 |

PRESENT WORTH OF 1

$v^n = (1 + i)^{-n}$

| $n$ | 2% | 2¼% | 2½% |
|---|---|---|---|
| 1 | 0.9803 9216 | 0.9779 9511 | 0.9756 0976 |
| 2 | 0.9611 6878 | 0.9564 7444 | 0.9518 1440 |
| 3 | 0.9423 2233 | 0.9354 2732 | 0.9285 9941 |
| 4 | 0.9238 4543 | 0.9148 4335 | 0.9059 5064 |

AMOUNT OF 1 FOR CERTAIN PARTS OF A YEAR

$s = (1 + i)^{1/p}$

| $p$ | 2% | 2¼% | 2½% |
|---|---|---|---|
| 2 | 1.0099 5049 | 1.0111 8742 | 1.0124 2284 |
| 3 | 1.0066 2271 | 1.0074 4444 | 1.0082 6484 |
| 4 | 1.0049 6293 | 1.0055 7815 | 1.0061 9225 |
| 6 | 1.0033 0589 | 1.0037 1532 | 1.0041 2392 |

If the printed $s$ and $v^n$ tables do not give valuations for a sufficient number of periods, they can be extended by multiplication. For instance, if the tables give valuations to 50 periods and the figure for 95 periods is desired, the needed figure may be obtained by multiplying the figures for 50 and 45 periods. Thus, $(1 + i)^{95} = (1 + i)^{50} \times (1 + i)^{45}$.

***Illustrations***

If interest is 2 per cent per annum effective, the compound amount of $1 is:
At end of 3 years: $(1 + i)^n = (1.02)^3 = 1.061208$

At end of $3\frac{1}{2}$ years: $(1 + i)^n = (1.02)^{\frac{7}{2}} = (1.02)^3 \times (1.02)^{\frac{1}{2}}$
$= 1.061208 \times 1.00995049 = 1.07176754$
Note also that $(1.02)^{\frac{7}{2}} = (1.02)^4 \div (1.02)^{\frac{1}{2}} = 1.08243216 \div 1.00995049$
$= 1.07176754$

If interest is 2 per cent per annum effective, the present worth of \$1 is:
At end of 48 months: $(1 + i)^{-n} = (1.02)^{-4} = 0.92384543$
At end of 14 months: $(1 + i)^{-n} = (1.02)^{-\frac{7}{6}} = (1.02)^{-1} \times (1.02)^{-\frac{1}{6}}$
$= 0.98039216 \div 1.00330589 = 0.97716176$

If interest is 4 per cent per annum, compounded semiannually, the compound amount of \$1 is:
At end of 12 months: $(1 + j/m)^{mn} = (1.02)^2 = 1.0404$
At end of 9 months: $(1 + j/m)^{mn} = (1.02)^{\frac{3}{2}} = 1.02 \times (1.02)^{\frac{1}{2}} = 1.02 \times 1.00995049$
$= 1.03014950$

If interest is 4 per cent per annum, compounded semiannually, the present worth of \$1 is:
At end of 18 months: $(1 + j/m)^{-mn} = (1.02)^{-3} = 0.94232233$
At end of 20 months: $(1 + j/m)^{-mn} = (1.02)^{-\frac{10}{3}} = (1.02)^{-3} \times (1.02)^{-\frac{1}{3}}$
$= 0.94232233 \div 1.00662271 = 0.93612267$

The reader is asked to study the above illustrations carefully and thereby acquire a knowledge of the simple mathematics involved in the compound amount and present worth of sums certain. As will be shown later, the formulas for annuities merely add the amounts and present worths of the various payments as geometric series.

**Relationship between effective and nominal interest rates.** When $m$ is unity the interest rate is effective. When $m$ is other than unity the interest rate is called nominal. Equating the valuation of $s$, the following equation results:

$$(1 + i)^n = (1 + j/m)^{mn}$$

By taking the $n$th root and then transposing 1, the equation becomes:

$$i = (1 + j/m)^m - 1$$

**Patterns as to dates of payments which are constant in amount.** In the table below, the first, second, third, and fourth payments of \$1 are represented by $I_1$, $I_2$, $I_3$, and $I_4$. The column headed 0 symbolizes the present time; 1, the end of the first year; 2, the end of the second year, etc.

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Case A | | $I_1$ | $I_2$ | | | $I_3$ | $I_4$ |
| Case B | | $I_1$ | $I_2$ | $I_3$ | $I_4$ | | |
| Case C | $I_1$ | $I_2$ | $I_3$ | $I_4$ | | | |
| Case D | | | $I_1$ | $I_2$ | $I_3$ | $I_4$ | |
| Case E | | | | $I_1$ | $I_2$ | $I_3$ | $I_4$ |

An annuity is a succession of payments, equal in size, made at regular intervals of time. If the periodic payments are made for a specified number of payments, the series is an annuity certain. If the payments are made for the life of a person, the series is a life (or contingent) annuity. If the payments are made forever, the series is a perpetuity. The term of an annuity certain, or the period of time covered by an annuity certain, is the time elapsing between the first and last periodic payments plus one payment period.

In Case A, the four payments are not made at regular intervals of time so the series is not an annuity. The other cases, however, have payments made at regular intervals of time and therefore are annuities certain. If the first payment of an annuity is payable immediately, the series is an "annuity due." If the first payment is payable one payment period hence, the series is an "ordinary annuity." If the first payment is payable more than one period hence, the series is a "deferred annuity." Classified by the date of the first payment, Case B is an ordinary annuity; Case C, an annuity due; Case D, an ordinary annuity deferred one payment period; and Case E, either an ordinary annuity deferred two payment periods or an annuity due deferred three payment periods. Annuities may also be classified by the location of the payment period that does not lie between the first and the last payments; if the extra payment period lies before the first payment, the series is an ordinary annuity, and if the extra payment period lies after the last payment, the series is an annuity due.

**Compound amount of annuity when each payment is $1.** The "amount or "final value" of an annuity is the sum accumulated at the end of its term if the periodic payments are placed at compound interest as soon as received. In order to avoid the confusion caused by special formulas for nominal interest and by payment periods of other than a year's duration, the following symbols are used in this volume:

*soa* = Amount of ordinary annuity having a periodic payment of $1
*sad* = Amount of annuity due having a periodic payment of $1
$r$ = Effective rate of interest per payment period
$t$ = Number of periodic payments to be made

While the amount of an annuity is usually computed by using a formula, it may be calculated by merely summing the compound amounts of the individual payments as of the end of the term of the annuity. The amount of a deferred annuity is always its amount ignoring the deferment; the period of deferment delays but does not change the final value of an annuity. If the periodic payments on page 207 are each equal to unity, and the effective interest per payment period is $r$, the amounts of the ordinary annuity in Case B and of the annuity due in Case C (both amounts com-

puted at the end of the fourth payment period and the final value of the first, second, third, and fourth payments listed in numerical order) would be:

Case B: $soa = (1+r)^3 + (1+r)^2 + (1+r) + 1$

and, Case C: $sad = (1+r)^4 + (1+r)^3 + (1+r)^2 + (1+r)$

Summing the equation for Case B as a geometric series, the equation becomes:

$$soa = \frac{(1+r)^4 - 1}{r}$$

or generalizing,

$$soa = \frac{(1+r)^t - 1}{r}$$

Obviously the equation for Case C is the equation for Case B multiplied by $(1+r)$ so the formula for Case C becomes:

$$sad = soa \times (1+r)$$

**Present worth of annuity when each payment is $1.** The present worth of an annuity is the sum an investor would be willing to pay for the series of future payments, compound interest being charged. In order to avoid the confusion caused by nominal interest and by payment periods of other than a year's duration, the following symbols are used in this volume:

$poa$ = Present worth of ordinary annuity, periodic payment $1
$pad$ = Present worth of annuity due, periodic payment $1
$pdoa$ = Present worth of deferred ordinary annuity, periodic payment $1
$pdad$ = Present worth of deferred annuity due, periodic payment $1
$r$ = Effective rate of interest per payment period
$t$ = Number of periodic payments to be made
$d$ = Number, integral or fractional, representing the number of times the payment period is contained in the period of deferment

While the present worth of an annuity is usually computed by using a formula, it may be calculated by merely summing the present worths of the individual payments as of the start of the term of the annuity. If the periodic payments on page 207 are each equal to unity and the effective interest rate is $r$, the present worths of the different annuities (present worth of the first, second, third, and fourth payments listed in numerical order) would be:

Case B: $poa = (1+r)^{-1} + (1+r)^{-2} + (1+r)^{-3} + (1+r)^{-4}$
Case C: $pad = 1 + (1+r)^{-1} + (1+r)^{-2} + (1+r)^{-3}$
Case D: $pdoa = (1+r)^{-2} + (1+r)^{-3} + (1+r)^{-4} + (1+r)^{-5}$
Case E: $pdad = (1+r)^{-3} + (1+r)^{-4} + (1+r)^{-5} + (1+r)^{-6}$

Summing the equation for Case B as a geometric series, the equation becomes:

$$poa = \frac{1 - (1 + r)^{-4}}{r}$$

or generalizing,

$$poa = \frac{1 - (1 + r)^{-t}}{r}$$

The equation for Case C is the equation for Case B multiplied by $(1 + r)$ so the formula for Case C becomes:

$$pad = poa \times (1 + r)$$

The equation for Case D is the equation for Case B multiplied by $(1 + r)^{-1}$ so the formula for Case D becomes:

$$pdoa = poa \times (1 + r)^{-1}$$

or generalizing,

$$pdoa = poa \times (1 + r)^{-d}$$

The equation for Case E is the equation for Case C multiplied by $(1 + r)^{-3}$ so the formula for Case E becomes:

$$pdad = pad \times (1 + r)^{-3}$$

or generalizing,

$$pdad = pad \times (1 + r)^{-d}$$

**Present worth of perpetuities when each payment is $1.** While the amount of a perpetuity is always infinity, practical use is made of the present worth of perpetuities. In order to avoid the confusion caused by nominal interest and by payment periods of other than a year's duration, the authors use the following symbols:

*pop* = Present worth of ordinary perpetuity, periodic payment $1
*ppd* = Present worth of perpetuity due, periodic payment $1
*pdop* = Present worth of deferred ordinary perpetuity, periodic payment $1
*pdpd* = Present worth of deferred perpetuity due, periodic payment $1
$r$ = Effective rate of interest per payment period
$t$ = Number of periodic payments to be made
$d$ = Number, integral or fractional, representing the number of times the payment period is contained in the period of deferment

Since the factor $(1 + r)^{-t}$, appearing in the annuity formulas, equals zero when $t$ becomes infinite, the present worth formulas for annuities may be reduced to the following for perpetuities:

$$pop = \frac{1}{r}$$
$$ppd = pop \times (1 + r)$$
$$pdop = pop \times (1 + r)^{-d}$$
$$pdpd = ppd \times (1 + r)^{-d}$$

**Equations for annuities and perpetuities when periodic payments are \$I.** If the periodic payments are \$I instead of \$1, the evaluations are $I$ times the evaluations when the periodic payments are \$1. The authors use the capital letters of the symbols for annuities and perpetuities having a periodic payment of \$1 to represent the same types of series when the periodic payment is other than \$1 (i.e., payment is \$I). Moreover, since standard notation has been universally adopted for the amount and present worth of an ordinary annuity, this notation is introduced here. By definition

$$\frac{(1 + r)^t - 1}{r} = s_{\overline{t}|r} \text{ (read } s \text{ angle } t \text{ at rate } r)$$

and

$$\frac{1 - (1 + r)^{-t}}{r} = a_{\overline{t}|r} \text{ (read } a \text{ angle } t \text{ at rate } r)$$

The right-hand members are merely shorthand notation for the algebraic expressions occurring on the left. Tables are available for these symbols for most of the standard rates.

The complete list of equations is ($r$, $t$, and $d$ having usual definitions):

$$SOA = I \times soa = I \times \frac{(1 + r)^t - 1}{r} = I \times s_{\overline{t}|r} \qquad \text{Equation No. 1}$$

$$SAD = SOA \times (1 + r) = I \times \frac{(1 + r)^t - 1}{r} \times (1 + r)$$
$$= I \times s_{\overline{t}|r} \times (1 + r) \qquad \text{Equation No. 2}$$

$$POA = I \times poa = I \times \frac{1 - (1 + r)^{-t}}{r} = I \times a_{\overline{t}|r} \qquad \text{Equation No. 3}$$

$$PAD = POA \times (1 + r) = I \times \frac{1 - (1 + r)^{-t}}{r} \times (1 + r)$$
$$= I \times a_{\overline{t}|r} \times (1 + r) \qquad \text{Equation No. 4}$$

$$PDOA = POA \times (1 + r)^{-d} = I \times \frac{1 - (1 + r)^{-t}}{r} \times (1 + r)^{-d}$$
$$= I \times a_{\overline{t}|r} \times (1 + r)^{-d} \qquad \text{Equation No. 5}$$

$$PDAD = PAD \times (1 + r)^{-d}$$
$$= I \times \frac{1 - (1 + r)^{-t}}{r} \times (1 + r)^{-d} \times (1 + r)$$
$$= I \times a_{\overline{t}|r} \times (1 + r)^{-d} \times (1 + r) \qquad \text{Equation No. 6}$$

$$POP = I \times pop = \frac{I}{r} \qquad \text{Equation No. 7}$$

$$PPD = POP \times (1 + r) = \frac{I}{r} \times (1 + r) \qquad \text{Equation No. 8}$$

$$PDOP = POP \times (1 + r)^{-d} = \frac{I}{r} \times (1 + r)^{-d} \qquad \text{Equation No. 9}$$

$$PDPD = PPD \times (1 + r)^{-d} = \frac{I}{r} \times (1 + r)^{-d} \times (1 + r) \qquad \text{Equation No. 10}$$

The above equations enable the reader to ascertain the amounts and present worths of the respective series, and if the amounts and present worths and all but one factor ($I$, $r$, $d$ and $t$) are known, to approximate by single interpolation the value of the missing factor.

*Illustration*

Given that the present worth of a 4-period annuity due, deferred 2 periods, payment \$10, is \$37.1725179, approximate the value of $r$ (this is Case D on page 207 when $I$ is \$10).

Substituting in Equation No. 6

$$\$37.1725179 = \$10 \times \frac{1 - (1 + r)^{-4}}{r} \times (1 + r)^{-2} \times (1 + r)$$

Simplifying,
$$3.71725179 = \frac{1 - (1 + r)^{-4}}{r} \times (1 + r)^{-1}$$

Using trial rates and figures from the $(1 + i)^{-n}$ printed tables, valuations for the right-hand member of the equation just above and below 3.71725179 must be ascertained (the excerpts given on page 206 have the needed valuations).

Using 2%:

$$\frac{1 - (1.02)^{-4}}{.02} \times (1.02)^{-1} = \frac{1 - 0.92384543}{.02} \times 0.98039216 = 3.73306735$$

Using 2¼%:

$$\frac{1 - (1.0225)^{-4}}{.0225} \times (1.0225)^{-1} = \frac{1 - 0.91484335}{.0225} \times 0.97799511 = 3.70145742$$

The closer the trial rates come to the given valuation the better because single interpolation estimates the interest rates with an error of not more than one twentieth of the difference between the interest rates used.

*Estimation of Rate by Interpolation Using First Differences*

| Rate | Valuation | Rate | Valuation |
|---|---|---|---|
| 2.00 | 3.73306735 | $r$ | 3.71725179 |
| 2.25 | 3.70145742 | 2.25 | 3.70145742 |
| − 0.25 | 0.03160993 | $x$ | 0.01579437 |

$$-0.25 : 0.03160993 = x : 0.01579437$$
$$x = -0.12491621$$
$$2.25 + x = 2.25 + (-0.12491621) = 2.12508379$$

The correct rate is 2.125%; the error of 0.00008379% is well within the maximum error according to the above rule [$\frac{1}{20} \times (2.25 - 2.00) = 0.0125\%$].

If greater accuracy is necessary, the approximation may be made by using other methods found in books on the mathematics of finance. For example, the Schurig-Baily formulas are discussed in the *Journal of Accountancy*, pages 393–394 of Volume 18, and pages 226-227 of Volume 32, and in the *American Accountant*, pages 362–365 of Volume 17.

**Constant payments when payment period is other than a year and interest rate is nominal.** As was mentioned on page 204, mathematicians usually express the interest rate upon an annual basis ($i$, if effective; $j$, if nominal). If the payments are not made annually, several procedures are available as explained in various texts on the mathematics of finance. With special tables and familiar formulas available, the mathematicians can evaluate series faster than can be done by the procedure recommended below. The average accountant usually has neither the special tables nor formulas available. The procedure given below will evaluate any annuity or perpetuity and is much simpler than the orthodox methods.

Regardless of the length of the payment period and how the interest rate is given, the authors recommend that the interest rate as given be converted to an effective interest rate per payment period by a formula which adapts the formula given on page 207 for converting $j$ to $i$. Since $i, j/m$, and $r$ are the effective interest rates per year, per conversion period, and per payment period, respectively, $i$ and $j/m$ can be converted into $r$ by using the following formula:

$$r = (1 + i)^c - 1 \quad \text{or} \quad r = (1 + j/m)^c - 1$$

where $c$ is the number, integral or fractional, representing the times the conversion period is contained in the payment period.

***Illustration No. 1***

Find the present worth of a 4-period ordinary annuity, periodic payments \$5, interest 6 per cent per annum, compounded semiannually, if the payment period is: Case 1, 4 months; Case 2, 24 months.

CASE 1

*Solution*

$c = \frac{4}{6} = \frac{2}{3}$

$t = 4$

$r = (1 + j/m)^c - 1 = (1.03)^{\frac{2}{3}} - 1$

$1 + r = (1.03)^{\frac{2}{3}}$

$(1 + r)^{-t} = (1.03)^{-\frac{8}{3}}$

$$POA = \$5 \times \frac{1 - (1.03)^{-\frac{8}{3}}}{(1.03)^{\frac{2}{3}} - 1}$$

$= \$19.0432$

*Proof*

| | | |
|---|---|---|
| 1st payment: | $\$5 \times (1.03)^{-\frac{2}{3}}$ | = \$ 4.9024 |
| 2nd payment: | $\$5 \times (1.03)^{-\frac{4}{3}}$ | = 4.8068 |
| 3rd payment: | $\$5 \times (1.03)^{-2}$ | = 4.7130 |
| 4th payment: | $\$5 \times (1.03)^{-\frac{8}{3}}$ | = 4.6210 |
| | Total = *POA* | = \$19.0432 |

CASE 2

*Solution*

$c = 4$

$t = 4$

$r = (1 + j/m)^c - 1 = (1.03)^4 - 1$

$1 + r = (1.03)^4$

$(1 + r)^{-t} = (1.03)^{-16}$

$$POA = \$5 \times \frac{1 - (1.03)^{-16}}{(1.03)^4 - 1}$$

$= \$15.0122$

*Proof*

| | | |
|---|---|---|
| 1st payment: | $\$5 \times (1.03)^{-4}$ | $= \$ 4.4424$ |
| 2nd payment: | $\$5 \times (1.03)^{-8}$ | $= 3.9470$ |
| 3rd payment: | $\$5 \times (1.03)^{-12}$ | $= 3.5069$ |
| 4th payment: | $\$5 \times (1.03)^{-16}$ | $= 3.1158$ |
| | Total = $POA$ | $= \$15.0121$ |

*Illustration No. 2*

Find the amount of a 3-period annuity due, payments $2 at intervals of 3 months, if the interest rate of 6 per cent per annum is compounded: Case 1, annually; Case 2, monthly.

CASE 1

*Solution*

$c = \frac{3}{12} = \frac{1}{4}$

$t = 3$

$r = (1 + i)^c - 1 = (1.06)^{\frac{1}{4}} - 1$

$1 + r = (1.06)^{\frac{1}{4}}$

$(1 + r)^t = (1.06)^{\frac{3}{4}}$

$$SAD = \$2 \times \frac{(1.06)^{\frac{3}{4}} - 1}{(1.06)^{\frac{1}{4}} - 1} \times (1.06)^{\frac{1}{4}}$$

$= \$6.1778$

*Proof*

| | | |
|---|---|---|
| 1st payment: | $\$2 \times (1.06)^{\frac{3}{4}}$ | $= \$2.0893$ |
| 2nd payment: | $\$2 \times (1.06)^{\frac{1}{2}}$ | $= 2.0591$ |
| 3rd payment: | $\$2 \times (1.06)^{\frac{1}{4}}$ | $= 2.0294$ |
| | Total = $SAD$ | $= \$6.1778$ |

CASE 2

*Solution*

$c = 3$

$t = 3$

$r = (1 + j/m)^c - 1 = (1.005)^3 - 1$

$1 + r = (1.005)^3$

$(1 + r)^t = (1.005)^9$

$$SAD = \$2 \times \frac{(1.005)^9 - 1}{(1.005)^3 - 1} \times (1.005)^3$$

$= \$6.1827$

*Proof*

| | | |
|---|---|---|
| 1st payment: | $\$2 \times (1.005)^9$ | $= \$2.0918$ |
| 2nd payment: | $\$2 \times (1.005)^6$ | $= 2.0608$ |
| 3rd payment: | $\$2 \times (1.005)^3$ | $= 2.0301$ |
| | Total = $SAD$ | $= \$6.1827$ |

These unusual problems are given to demonstrate the unlimited scope of the formulas. The 6 annuity formulas and 4 perpetuity formulas (see pages 211 and 212) will evaluate any annuity certain and any perpetuity. The simplicity in the form of the equations is very valuable because in business, outside the field of insurance, the interest, conversion, and payment periods are usually identical: i.e., the equations as a rule may be

used without converting the interest rate as given to the interest rate per payment period.

**Series when payments are irregular.** When a series is irregular both as to amount of payment and as to payment intervals, the evaluation of the series can be computed only by summing the amounts or present worths of the individual payments.

*Regular as to payment intervals but irregular as to size of payment.* Sometimes it is impractical to try to analyze the irregular sized payments into groups of annuities and sums certain. Frequently considerable time can be saved by such analysis. For instance, if in Case A (on page 207) $I_1$ and $I_2$ are each \$50, and $I_3$ and $I_4$ are each \$75, the present worth of the 4 payments is

$$\left\{\left[\$50 \times \frac{1-(1+r)^{-2}}{r}\right] + \left[\$75 \times \frac{1-(1+r)^{-2}}{r} \times (1+r)^{-4}\right]\right\}$$

*Illustration No. 1*

If money is worth 6 per cent per annum, compounded monthly, compute the present worth of the following payments as (Case A) sums certain and as (Case B) 5 different annuities.

| Due end of month | Total payments | Total payments analyzed into annuities | | | | |
|---|---|---|---|---|---|---|
| | | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 |
| 0 | \$5 | \$2 | \$2 | .. | \$1 | .. |
| 12 | 7 | .. | 2 | \$3 | 1 | \$1 |
| 24 | 9 | 2 | 2 | 3 | 1 | 1 |
| 36 | 4 | .. | .. | 3 | 1 | .. |
| 48 | 3 | .. | .. | 3 | .. | .. |

CASE A

$$\$5 + [\$7 \times (1.005)^{-12}] + [\$9 \times (1.005)^{-24}] + [\$4 \times (1.005)^{-36}] + [\$3 \times (1.005)^{-48}] = \$25.281883$$

CASE B

$$\text{No. 1:} \quad \$2 \times \frac{1-(1.005)^{-48}}{(1.005)^{24}-1} \times (1.005)^{24} = \$\ 3.774371$$

$$\text{No. 2:} \quad \$2 \times \frac{1-(1.005)^{-36}}{(1.005)^{12}-1} \times (1.005)^{12} = \quad 5.658182$$

$$\text{No. 3:} \quad \$3 \times \frac{1-(1.005)^{-48}}{(1.005)^{12}-1} = \quad 10.355503$$

$$\text{No. 4:} \quad \$1 \times \frac{1-(1.005)^{-48}}{(1.005)^{12}-1} \times (1.005)^{12} = \quad 3.664736$$

$$\text{No. 5:} \quad \$1 \times \frac{1-(1.005)^{-24}}{(1.005)^{12}-1} = \quad 1.829091$$

$$\text{Total} = \$25.281883$$

*Illustration No. 2*

If money is worth 6 per cent per annum, compounded monthly, compute the compound amount at the end of 4 years of the following payments as (Case A) sums certain and (Case B) as 3 different annuities.

| Due end of month | Total payments | Total payments analyzed into annuities | | |
|---|---|---|---|---|
| | | No. 1 | No. 2 | No. 3 |
| 0 | $1 | $1 | .. | .. |
| 12 | 2 | 1 | $1 | .. |
| 24 | 3 | 1 | 1 | $1 |
| 36 | 2 | .. | 1 | 1 |
| 48 | 1 | .. | .. | 1 |

CASE A

$$[\$1 \times (1.005)^{48}] + [\$2 \times (1.005)^{36}] + [\$3 \times (1.005)^{24}] + [\$2 \times (1.005)^{12}] + \$1 = \$10.168684$$

CASE B

$$\text{No. 1: } \$1 \times \frac{(1.005)^{36} - 1}{(1.005)^{12} - 1} \times (1.005)^{24} = \$\ 3.594329$$

$$\text{No. 2: } \$1 \times \frac{(1.005)^{36} - 1}{(1.005)^{12} - 1} \times (1.005)^{12} = \quad 3.385517$$

$$\text{No. 3: } \$1 \times \frac{(1.005)^{36} - 1}{(1.005)^{12} - 1} = \quad 3.188838$$

$$\text{Total} = \$10.168684$$

Illustration No. 2 demonstrates that the amount of an annuity at a date subsequent to the end of the term of the annuity can be determined by compounding the amount of the annuity at the end of its term as a sum certain. This point is important if the interest rate changes, a subject discussed in the next section.

**When payment and conversion periods coincide.** When constant payments are made at conversion dates starting one period hence, equations (1) and (3) as given on page 211 apply. If a yearly effective rate is being used, $r = i$ and $t = n$. If a nominal rate is in effect, $r = j/m$ and $t = mn$.

*Ordinary annuity when interest rate changes.* If the interest rate $r$ prevails for $y$ periods and the rate $g$ for $(n-y)$ periods, the amount and present worth formulas are respectively:

Special Annuity Formula No.1

$$s_{\overline{n}|r} \text{ for } y;\ g \text{ for } (n-y) = [s_{\overline{y}|r} \times (1+g)^{n-y}] + s_{\overline{n-y}|g}$$

Special Annuity Formula No. 2

$$a_{\overline{n}|r} \text{ for } y;\ g \text{ for } (n-y) = [a_{\overline{n-y}|g} \times (1+r)^{-y}] + a_{\overline{y}|r}$$

*Illustration*

Ordinary annuity of \$1 payable for 5 years has an effective interest rate of 6 per cent for the first 2 years and 5 per cent for the last 3 years. Case A: What is its amount? Case B: What is its present worth?

CASE A

| *Solution* | *Proof* | | |
|---|---|---|---|
| $s_{\overline{5}\rceil .06}$ for 2 years; | 1st payment: \$1 × 1.06 × $(1.05)^3$ | = | \$1.2271 |
| .05 for 3 years | 2nd payment: \$1 × $(1.05)^3$ | = | 1.1576 |
| = $[s_{\overline{2}\rceil .06} \times (1.05)^3] + s_{\overline{3}\rceil .05}$ | 3rd payment: \$1 × $(1.05)^2$ | = | 1.1025 |
| = 5.5372 | 4th payment: \$1 × (1.05) | = | 1.0500 |
| \$1 × 5.5372 = \$5.5372 | 5th payment: \$1 | = | 1.0000 |
| | Total | = | \$5.5372 |

CASE B

| *Solution* | *Proof* | | |
|---|---|---|---|
| $a_{\overline{5}\rceil .06}$ for 2 years; | 1st payment: \$1 × $(1.06)^{-1}$ | = | \$0.94340 |
| .05 for 3 years | 2nd payment: \$1 × $(1.06)^{-2}$ | = | 0.89000 |
| = $[a_{\overline{3}\rceil .05} \times (1.06)^{-2}] + a_{\overline{2}\rceil .06}$ | 3rd payment: \$1 × $(1.06)^{-2}$ × $(1.05)^{-1}$ | = | 0.84761 |
| = 4.25707 | 4th payment: \$1 × $(1.06)^{-2}$ × $(1.05)^{-2}$ | = | 0.80725 |
| \$1 × 4.25707 = \$4.25707 | 5th payment: \$1 × $(1.06)^{-2}$ × $(1.05)^{-3}$ | = | 0.76881 |
| | Total | = | \$4.25707 |

*Ordinary annuity when payments form geometric progression.* If the interest rate is constant but the periodic payments vary so that they form a geometric progression, the amount and present worth formulas are respectively (common ratio designated by $w$):

$$(vs)_{\overline{n}\rceil r} = \frac{(1+r)^n - (w)^n}{(1+r) - w}$$ Special Annuity Formula No. 3

$$(va)_{\overline{n}\rceil r} = \frac{1 - [(w)^n \times (1+r)^{-n}]}{(1+r) - w}$$ Special Annuity Formula No. 4

*Illustration*

If interest is 6 per cent per annum effective and the payments made at the end of year periods are \$50, \$100, \$200, and \$400, compute (Case A) the amount and (Case B) the present worth of the varying annuity. Note that $w$ is equal to 2.

CASE A

| *Solution* | *Proof* | | |
|---|---|---|---|
| $(vs)_{\overline{4}\rceil .06} = \frac{(1.06)^4 - (2)^4}{(1.06) - 2}$ | 1st payment: \$ 50 × $(1.06)^3$ | = | \$ 59.5508 |
| = 15.678216 | 2nd payment: \$100 × $(1.06)^2$ | = | 112.3600 |
| \$50 × 15.678216 = \$783.9108 | 3rd payment: \$200 × (1.06) | = | 212.0000 |
| | 4th payment: \$400 | = | 400.0000 |
| | Total | = | \$783.9108 |

CASE B

*Solution*

$$(va)_{\overline{4}|.06} = \frac{1 - [(2)^4 \times (1.06)^{-4}]}{(1.06) - 2}$$

$$= 12.4186155$$

$$\$50 \times 12.4186155 = \$620.9308$$

*Proof*

| | | |
|---|---|---|
| 1st payment: | $ 50 × (1.06)$^{-1}$ = | $ 47.1698 |
| 2nd payment: | $100 × (1.06)$^{-2}$ = | 88.9996 |
| 3rd payment: | $200 × (1.06)$^{-3}$ = | 167.9239 |
| 4th payment: | $400 × (1.06)$^{-4}$ = | 316.8375 |
| | Total = | $620.9308 |

*Ordinary annuity when payments form arithmetic progression.* If the interest rate is constant but the periodic payments vary so that they form an arithmetic progression, the amount and present worth formulas are respectively (common difference in payments reduced to basis of unity designated by $d$):

$$(vs)_{\overline{n}|r} = s_{\overline{n}|r} + \frac{d \times (s_{\overline{n}|r} - n)}{r}$$ Special Annuity Formula No. 5

$$(va)_{\overline{n}|r} = a_{\overline{n}|r} + \frac{d \times [a_{\overline{n}|r} - n(1+r)^{-n}]}{r}$$ Special Annuity Formula No. 6

*Illustration*

If interest is 6 per cent per annum effective and the payments made at the end of year periods are $50, $60, $70, and $80, compute (Case A) the amount and (Case B) the present worth of the varying annuity. Note that $d$ is $.20.

CASE A

*Solution*

$$(vs)_{\overline{4}|.06} = s_{\overline{4}|.06} + \frac{.2 \times [s_{\overline{4}|.06} - 4]}{.06}$$

$$= 5.623336$$

$$\$50 \times 5.623336 = \$281.1668$$

*Proof*

| | | |
|---|---|---|
| 1st payment: | $50 × (1.06)$^{3}$ = | $ 59.5508 |
| 2nd payment: | $60 × (1.06)$^{2}$ = | 67.4160 |
| 3rd payment: | $70 × (1.06) = | 74.2000 |
| 4th payment: | $80 = | 80.0000 |
| | Total = | $281.1668 |

CASE B

*Solution*

$$(va)_{\overline{4}|.06} = a_{\overline{4}|.06} + \frac{.2 \times [a_{\overline{4}|.06} - 4(1.06)^{-4}]}{.06}$$

$$= 4.45420884$$

$$\$50 \times 4.45420884 = \$222.7104$$

*Proof*

| | | |
|---|---|---|
| 1st payment: | $50 × (1.06)$^{-1}$ = | $ 47.1698 |
| 2nd payment: | $60 × (1.06)$^{-2}$ = | 53.3998 |
| 3rd payment: | $70 × (1.06)$^{-3}$ = | 58.7733 |
| 4th payment: | $80 × (1.06)$^{-4}$ = | 63.3675 |
| | Total = | $222.7104 |

**Limitation of accountant's activity with appraisals.** The work of estimating the amount of gross future income and the time distribution of its receipt is done by a valuation engineer rather than by an accountant. The choice of a rate, or rates, of interest is dependent upon the degree of risk involved and, therefore, is the function of the valuation engineer.

The accountant is well qualified to pass upon the cost accounting side of the determination of net income. The accountant should also be able to approve the mathematical premises used in the appraisal and to verify the calculations involved.

**Evaluation of income producing property.** In order to be able to tabulate the data concerning the various methods of evaluating income producing properties, the different methods are numbered as follows:

Method No. 1. Grimes and Craigue Sinking Fund Method [1]
Method No. 2. Morkill Sinking Fund Method [2]
Method No. 3. Hoskold Sinking Fund Method [3]
Method No. 3*a*. Hoskold-O'Donohue Sinking Fund Method [4]
Method No. 4. Compound Interest Sinking Fund Method [5]
Method No. 5. Compound Interest Actuarial Method [6]
Method No. 6. Compound Interest Deferment Method [7]

*Income defined.* The valuation engineer defines net income as the sum of the interest on investment and the return of the capital outlay; additions to capital investment from income are treated as negative income and are cleared through the sinking fund. In terms of a bond, income is the sum of the interest payments and the maturity value of the principal. In terms of a mine, income is the net profit before deducting depletion.

*Repayment of principal.* The repayment of the investor is insured by methods Nos. 1, 2, 3, 3*a*, and 4 by using the sinking fund principle and by methods Nos. 5 and 6 by using the amortization principle. Both methods Nos. 5 and 6 allow the investor interest on only the unamortized principal, but No. 6 values each year's income separately while No. 5 values the income for all of the years as a whole. In method No. 6, each income installment is applied first against the interest on the outlay made to secure the specific income installment and then against that particular outlay. In method No. 5, each income installment is applied against the interest on the whole investment and then against the whole investment.

[1] Grimes, J. A., and Craigue, W. H., *Principles of Valuation* (New York: Prentice-Hall, Inc., 1928); Guthmann, 5 *Accounting Review* 226–230; Schlauch, W. S., and Lang, T., *Mathematics of Business and Finance* (New York: Ronald Press Company, 1937), pp. 506–508.

[2] Morkill, D. B., in *Mining and Scientific Press*, Volume 116, p. 691, and Volume 117, p. 276; Grimes and Craigue, *op. cit.*, pp. 25–27, 42–45.

[3] Hoskold, H. D., *Engineer's Valuing Assistant* (London: Longmans, Green and Company, 1877); Grimes and Craigue, *op. cit.*, pp. 25–27, 30–42; Schlauch and Lang, *op. cit.*, p. 500.

[4] O'Donohue, T. A., in *Transactions of the Institute of Mining Engineers* (London, 1907), Volume 32, p. 388; Grimes and Craigue, *op. cit.*, pp. 25–27, 30–42; Marston, A., and Agg, T. R., *Engineering Valuation* (New York: McGraw-Hill Book Company, 1936), p. 407.

[5] Grimes and Craigue, *op. cit.*, pp. 25–29, 87.

[6] Grimes and Craigue, *op. cit.*, pp. 22–24, 87.

[7] Grimes and Craigue, *op. cit.*, pp. 19–21, 87.

Methods Nos. 1, 2, 3, 3*a*, and 4 return no capital to the investor during the period of investment, and whenever the interest due to the investor exceeds the income, the shortage is made good out of the sinking fund. Should the sinking fund have a negative balance, under all of the methods except No. 3, the unpaid interest is paid to the investor as soon as possible and interest on the unpaid interest is paid at the rates specified in the respective premises. Method No. 3 takes the commercial view that unpaid interest is an involuntary addition to the speculative investment. The difference between the premises of methods No. 3 and No. 3*a* affects valuations only when income is deferred.

*Rates of interest.* As the rates of interest should be affected by the degree of risk, the Grimes and Craigue method, which has the most exhaustive analysis of interest, uses three interest rates:

$s$: The safe rate of interest
$f$: The semi-speculative rate
$u$: The speculative rate

According to the Grimes and Craigue method, the following rates would be used if an investor purchased a mine: Interest at $s$ per cent would be paid by the sinking fund trustee or by the investor himself if the income is to be paid to him without deducting an allowance for depletion; interest at $f$ per cent would be paid to the investor on the funded portion of his original investment and on amounts placed in the sinking fund at the date of investment for future additions to the mining machinery; interest at $u$ per cent would be paid to the investor on the unfunded portion of his original investment; and interest at $(u - f + s)$ per cent would be paid to the investor on negative balances in the sinking fund (caused by payments not starting within a normal payment period of date of investment).

The interest rates used in the various methods are as follows:

| | Interest paid to investor | | | Interest |
|---|---|---|---|---|
| Method | On unfunded investment | On positive balance in fund | On negative balance in fund | earned by sinking fund |
| No. 1 | $u$ | $f$ | $(u - f + s)$ | $s$ |
| No. 2 | $u$ | $s$ | $u$ | $s$ |
| No. 3 | $u$ | $u$ | $u$ | $s$ |
| No. 3*a* | $u$ | $u$ | $s$ | $s$ |
| No. 4 | $u$ | $u$ | $u$ | $u$ |
| No. 5 | $u$ | no fund | no fund | no fund |
| No. 6 | $u$ | no fund | no fund | no fund |

From these premises, the following equalities can be established:

Method No. 2: $f = s$
Method No. 3: $f = u$ (inconsistent only in regard to deferred income)

Method No. 3*a*: $f = u$
Method No. 4: $f = u = s$
Method No. 5: $f = s =$ zero
Method No. 6: $f = s =$ zero

*Formulas evaluating future income regular as to time but not constant in amount.* While the deviation of the Grimes and Craigue general formula for evaluating income producing properties is too mathematical and lengthy to be given here,[8] the general formulas for the other methods may be readily obtained by applying the above table of equalities in interest rates to the Grimes and Craigue formula. The general formulas for evaluating future income are ($V$ denotes present worth of investment; $A$, the periodic payments; $n$, the number of payments; and all interest rates are effective per payment period):

| Methods | Valuation formula for terminable income |
|---|---|
| No. 1 | $V = \frac{(u-f+s)[1+(u-f+s)]^n}{u[1+(u-f+s)]^n-f+s}\left(\frac{A_1}{[1+(u-f+s)]} + \cdots + \frac{A_n}{[1+(u-f+s)]^n}\right)$ |
| Nos. 2, 4, 5, 6 | $V = \frac{A_1}{(1+u)} + \frac{A_2}{(1+u)^2} + \frac{A_3}{(1+u)^3} + \cdots + \frac{A_n}{(1+u)^n}$ |
| Nos. 3, 3*a* | $V = \frac{s(1+s)^n}{u(1+s)^n-u+s}\left(\frac{A_1}{(1+s)} + \frac{A_2}{(1+s)^2} + \cdots + \frac{A_n}{(1+s)^n}\right)$ |

### *Illustrative Problem*

How much could an investor pay for an asset which will be valueless at the end of 4 years but which will yield \$1,000 at the end of the first year, \$1,200 at the end of the second year, \$500 at the end of the third year, and \$8,000 at the end of the fourth year? The interest rates for the different valuation methods are:

| | No. 1 | No. 2 | No. 3 | No. 3*a* | No. 4 | No. 5 | No. 6 |
|---|---|---|---|---|---|---|---|
| $s$ . . . . . | 4 | 4 | 4 | 4 | nil | nil | nil |
| $u$ . . . . . | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| | 8 | nil | nil | nil | nil | nil | nil |

### *Solution*

No. 1 $$V = \frac{.06 \times (1.06)^4}{[.1 \times (1.06)^4] - .08 + .04}\left(\frac{\$1{,}000}{(1.06)} + \frac{\$1{,}200}{(1.06)^2} + \frac{\$500}{(1.06)^3} + \frac{\$8{,}000}{(1.06)^4}\right) = \$7{,}700.61$$

Nos. 2, 4, 5, 6 $$V = \frac{\$1{,}000}{(1.10)} + \frac{\$1{,}200}{(1.10)^2} + \frac{\$500}{(1.10)^3} + \frac{\$8{,}000}{(1.10)^4} = \$7{,}740.59$$

Nos. 3, 3*a* $$V = \frac{.04 \times (1.04)^4}{[.1 \times (1.04)^4] - .1 + .04}\left(\frac{\$1{,}000}{(1.04)} + \frac{\$1{,}200}{(1.04)^2} + \frac{\$500}{(1.04)^3} + \frac{\$8{,}000}{(1{,}04)^4}\right) = \$7{,}681.05$$

[8] Grimes and Craigue, *op. cit.*, pp. 48–52.

## *Proof of Accuracy and Investor's Entries*

NO. 1. GRIMES AND CRAIGUE SINKING FUND METHOD

| End of Year (1) | Cash Dr.; Cr.* (2) | Income from Investment: Funded Dr.; Cr.* (3) | Income from Investment: Unfunded Dr.; Cr.* (4) | Funded Investment: Dr.; Cr.* (5) | Funded Investment: Balance (6) | Unfunded Investment: Dr.; Cr.* (7) | Unfunded Investment: Balance (8) |
|---|---|---|---|---|---|---|---|
| 0 | $7,700.61* | ..... | ..... | ..... | ..... | $7,700.61 | $7,700.61 |
| 1 | 770.06 | ..... | $770.06* | $ 229.94 | $ 229.94 | 229.94* | 7,470.67 |
| 2 | 765.47 | $18.40* | 747.07* | 434.53<br>9.20 | 673.67 | 443.73* | 7,026.94 |
| 3 | 756.58 | 53.89* | 702.69* | 256.58*<br>26.95 | 444.04 | 229.63 | 7,256.57 |
| 4 | 761.18 | 35.52* | 725.66* | 7,238.82<br>17.75 | 7,700.61 | 7,256.57* | ..... |
| 4 | 7,700.61 | ..... | ..... | 7,700.61* | ..... | ..... | ..... |

NO. 2. MORRILL SINKING FUND METHOD

| End of Year (1) | Cash Dr.; Cr.* (2) | Income from Investment: Funded Dr.; Cr.* (3) | Income from Investment: Unfunded Dr.; Cr.* (4) | Funded Investment: Dr.; Cr.* (5) | Funded Investment: Balance (6) | Unfunded Investment: Dr.; Cr.* (7) | Unfunded Investment: Balance (8) |
|---|---|---|---|---|---|---|---|
| 0 | $7,740.59* | ..... | ..... | ..... | ..... | $7,740.59 | $7,740.59 |
| 1 | 774.06 | ..... | $774.06* | $ 225.94 | $ 225.94 | 225.94* | 7,514.65 |
| 2 | 760.51 | $ 9.04* | 751.47* | 439.49<br>9.04 | 674.47 | 448.53* | 7,066.12 |
| 3 | 733.59 | 26.98* | 706.61* | 233.59*<br>26.98 | 467.86 | 206.61 | 7,272.73 |
| 4 | 745.98 | 18.71* | 727.27* | 7,254.02<br>18.71 | 7,740.59 | 7,272.73* | ..... |
| 4 | 7,740.59 | ..... | ..... | 7,740.59* | ..... | ..... | ..... |

NOS. 3 AND 3*a*. HOSKOLD AND HOSKOLD-O'DONOHUE SINKING FUND METHODS

| End of Year (1) | Cash Dr.; Cr.* (2) | Income from Investment: Funded Dr.; Cr.* (3) | Income from Investment: Unfunded Dr.; Cr.* (4) | Funded Investment: Dr.; Cr.* (5) | Funded Investment: Balance (6) | Unfunded Investment: Dr.; Cr.* (7) | Unfunded Investment: Balance (8) |
|---|---|---|---|---|---|---|---|
| 0 | $7,681.05* | ..... | ..... | ..... | ..... | $7,681.05 | $7,681.05 |
| 1 | 768.11 | ..... | $768.11* | $ 231.89 | $ 231.89 | 231.89* | 7,449.16 |
| 2 | 768.11 | $23.19* | 744.92* | 431.89<br>9.28 | 673.06 | 441.17* | 7,007.99 |
| 3 | 768.11 | 67.31* | 700.80* | 268.11*<br>26.92 | 431.87 | 241.19 | 7,249.18 |
| 4 | 768.11 | 43.19* | 724.92* | 7,231.89<br>17.29 | 7,681.05 | 7,249.18* | ..... |
| 4 | 7,681.05 | ..... | ..... | 7,681.05* | ..... | ..... | ..... |

NO. 4. COMPOUND INTEREST SINKING FUND METHOD

| End of Year (1) | Cash Dr.; Cr.* (2) | Income from Investment: Funded Dr.; Cr.* (3) | Income from Investment: Unfunded Dr.; Cr.* (4) | Funded Investment: Dr.; Cr.* (5) | Funded Investment: Balance (6) | Unfunded Investment: Dr.; Cr.* (7) | Unfunded Investment: Balance (8) |
|---|---|---|---|---|---|---|---|
| 0 | $7,740.59* | ..... | ..... | ..... | ..... | $7,740.59 | $7,740.59 |
| 1 | 774.06 | ..... | $774.06* | $ 225.94 | $ 225.94 | 225.94* | 7,514.65 |
| 2 | 774.06 | $22.59* | 751.47* | 425.94<br>22.59 | 674.47 | 448.53* | 7,066.12 |
| 3 | 774.06 | 67.45* | 706.61* | 274.06*<br>67.45 | 467.86 | 206.61 | 7,272.73 |
| 4 | 774.06 | 46.79* | 727.27* | 7,225.94<br>46.79 | 7,740.59 | 7,272.73* | ..... |
| 4 | 7,740.59 | ..... | ..... | 7,740.59* | ..... | ..... | ..... |

NOTES ON SCHEDULES FOR METHODS NOS. 1, 2, 3, 3*a*, AND 4

Item in column (3) is the previous balance in column (6) multiplied by $f$ in method No. 1, by $s$ in method No. 2, and by $u$ in methods Nos. 3, 3*a*, and 4. Item in column (4) is $u$ per cent of the previous balance in column (8) in all the sinking fund methods. Item in column (2) is the sum of the current items in columns (3) and (4), except for the entries for original investment and for the recovery of principal from the sinking fund. The analysis of income into that received from the funded and from the unfunded investment is unnecessary in methods Nos. 3, 3*a*, and 4 because the total income is equal to $u$ per cent of the original investment. Column (5) contains the excess of the income (symbolized by $A_1$, $A_2$, etc.) for the current year over the current item in column (2) plus the product of the previous balance in column (6) multiplied by $s$ per cent in methods Nos. 2, 3, and 3*a*, and by $u$ per cent in method No. 4. Column (6) item is the algebraic sum of its previous balance and the current items in column (5). Item in column (7) agrees with the algebraic sum of the current items in column (5). Item in column (8) is the algebraic difference between its previous balance and the current item in column (7).

It is important to remember that the above procedure may not be used for method No. 3 if the sinking fund has a negative balance.

NO. 5. COMPOUND INTEREST ACTUARIAL METHOD

| End of Year (1) | Cash Dr.; Cr.* (2) | Income Dr.; Cr.* (3) | Investment Dr.; Cr.* (4) | Investment Balance (5) |
|---|---|---|---|---|
| 0 | $7,740.59* | ..... | $7,740.59 | $7,740.59 |
| 1 | 1,000.00 | $774.06* | 225.94* | 7,514.65 |
| 2 | 1,200.00 | 751.47* | 448.53* | 7,066.12 |
| 3 | 500.00 | 706.61* | 206.61 | 7,272.73 |
| 4 | 8,000.00 | 727.27* | 7,272.73* | ..... |

NO. 6. COMPOUND INTEREST DEFERMENT METHOD

| End of Year (1) | Cash Dr.; Cr.* (2) | Income Dr.; Cr.* (3) | Investment Dr.; Cr.* (4) | Investment Balance (5) |
|---|---|---|---|---|
| 0 | $7,740.59* | ..... | $7,740.59 | $7,740.59 |
| 1 | 1,000.00 | $ 90.91* | 909.09* | 6,831.50 |
| 2 | 1,200.00 | 208.26* | 991.74* | 5,839.76 |
| 3 | 500.00 | 124.34* | 375.66* | 5,464.10 |
| 4 | 8,000.00 | 2,535.90* | 5,464.10* | ..... |

NOTES ON METHODS NO. 5 AND NO. 6

Item in column (2) is the current income (symbolized by $A_1$, $A_2$, etc., in formulas) in both methods. Column (3) item is $u$ per cent of the previous balance in column (5) in method No. 5, but is the difference between the

current items in columns (2) and (4) in method No. 6. Column (4) item is the algebraic difference between the current items in columns (2) and (3) in method No. 5, but is the product of the current income multiplied by $(1 + u)^{-y}$ where $y$ is the number of years elapsing between the date of receiving that specific income installment and the date of the purchase of the entire investment in method No. 6. In both methods, the column (5) item is its own previous balance minus the current item in column (4).

Accountants should not use the compound interest deferment method for allocating income even though the method is used to evaluate the investment. Method No. 6 may be used to evaluate the investment and then method No. 5 used to allocate income; this procedure is followed in the case of serial bonds which are valued for each maturity series separately and then amortized as one single investment.

*Formulas evaluating future income constant as to time and amount.* If the payments start one period hence, they form an ordinary annuity and the general formulas given on page 221 may be simplified to the following:

| Methods | Valuation formula for terminable income |
|---|---|
| No. 1 | $V = A\dfrac{[1 + (u - f + s)]^n - 1}{u[1 + (u - f + s)]^n - f + s} = \dfrac{A}{\dfrac{1}{s_{\overline{n}\rceil(u-f+s)}} + u}$ |
| Nos. 2, 4, 5, 6 | $V = A\dfrac{(1 + u)^n - 1}{u(1 + u)^n} = A \times a_{\overline{n}\rceil u}$ |
| Nos. 3, 3a | $V = A\dfrac{(1 + s)^n - 1}{u(1 + s)^n - u + s} = \dfrac{A}{\dfrac{1}{s_{\overline{n}\rceil s}} + u}$ |

As the tabulation of the investor's entries follows the same rules when these formulas are used as those employed when the respective general formulas are used, no special illustrations are given here. Attention is called to the fact that the second form of the formula for methods Nos. 2, 4, 5, and 6 is the ordinary equation for the present worth of an ordinary annuity. The second form of the equation for methods Nos. 3 and 3a is the Hoskold formula for evaluating wasting assets; this formula is so well known that the U.S. Treasury Department published a table showing the present value of each $1 of total income receivable in equal amounts, Hoskold method premises, 4 per cent sinking fund rate of interest,[9] and Grimes and Craigue presented enlarged Hoskold tables with the sinking fund computed at 3, 4, 5, and 6 per cent.[10]

*Formulas when no income for d periods and then constant income for $(n - d)$*

[9] Quoted in (1923) Saliers 465.
[10] Grimes and Craigue, *op. cit.*, pp. 229–234.

*periods.* The evaluation formulas for these deferred ordinary annuities [11] are not given here because the general formulas may be used except under original Hoskold premises (method No. 3). If valuations, except for the original Hoskold premises, involve so many annual incomes that using these general formulas is laborious, the expression within the parentheses in the general formula may be evaluated as an ordinary annuity of $(n - d)$ years, deferred $d$ years, when the interest rate is $(u - f + s)$ per cent for method No. 1, $u$ per cent for methods Nos. 2, 4, 5, and 6, and $s$ per cent for method No. 3*a*.

Because the original Hoskold formula pays the investor $u$ per cent upon negative balances in the sinking fund instead of $s$ per cent as would be mathematically consistent (see method No. 3*a*), the general formula for method No. 3 must not be used when the annual payments are deferred. Grimes and Craigue [12] have derived the following formula for deferred payments under the original Hoskold premises:

$$\text{No. 3: } V = A\,\frac{(1+s)^{n-d}-1}{u(1+s)^{n-d}-u+s}\cdot\frac{1}{(1+u)^{d}} = A\,\frac{s_{\overline{n-d}|s}}{(1+u)^{d}[1+us_{\overline{n-d}|s}]}$$

If the annual payments are deferred, it is important to remember that under methods Nos. 1, 2, 3*a*, and 4 unpaid interest should be set up by the investor as Interest Receivable, which asset earns $(u - f + s)$ per cent in method No. 1, $s$ per cent in method No. 3*a*, and $u$ per cent in methods Nos. 2 and 4. Under the original Hoskold premises (No. 3) and the premises of the compound interest actuarial method (No. 5), the unpaid interest is added to the original investment and earns $u$ per cent interest.

**Adaptation of Hoskold formula for valuing constant periodic income.** The usual Hoskold formula may be written as:

$$A = uV + \frac{V}{s_{\overline{n}|s}}$$

The periodic payment, $A$, is equal to the sum of the income paid to the investor plus the sinking fund installment needed to replace the capital. As the sinking fund in some problems does not always have to equal the value of the investment, where $F$ is the amount finally needed in the fund, the equation may be stated as:

$$A = uV + \frac{F}{s_{\overline{n}|s}}$$

*Use with wasting assets.* The ordinary form of the Hoskold formula is not adapted for evaluating wasting assets which have a scrap value. The special form of the formula may be used in such valuations by letting $F = V -$ Scrap Value.

[11] Given in Grimes and Craigue, *op. cit.*, pp. 87–88.
[12] Grimes and Craigue, *op. cit.*, p. 88.

*Illustrative Problem No. 1*

Evaluate a taxicab which yields, before depreciation, $500 (assume at the end of each year) for 4 years, scrap value $100, if an annual sinking fund, which accumulates at 4 per cent per annum effective, is created to restore the capital invested less the scrap value, and if the purchaser demands 10 per cent per annum effective.

*Solution*

$$\$500 = .1V + \frac{V - \$100}{s\overline{4}|.04}$$

$$V = \$1{,}560.55$$

*Illustrative Problem No. 2*

Determine the price that the owner of a business can afford to pay for a machine the use of which will effect an annual saving of $1,000, if the savings are invested in the business which earns 10 per cent per annum on the capital employed, if the current rate on investments is 6 per cent per annum, and if the life of the machine is 4 years.

*Solution with Ordinary Formula*

$$V = \$1{,}000 \div \left[\frac{1}{s\overline{4}|.10} + .06\right] = \$3{,}630.15$$

*Solution with Special Formula*

$$\$1{,}000 = .06V + \frac{V}{s\overline{4}|.10}$$

$$V = \$3{,}630.15$$

*Use with leases.* While leases are usually valued under the compound interest accrual premises (see page 314), they may be valued according to the Hoskold formula (S.R. 5798, IV–1 CB 267 used 6 per cent as the rate of return and 4 per cent as the rate for the sinking fund).

*Illustrative Problem*

Find the value of B's leasehold if he leases some property for 8 years at $6,500 a year from A and sublets to C at $15,000 a year, remunerative interest rate 7 per cent per annum and accumulative interest rate 3 per cent per annum.

*Solution with Ordinary Formula*

$$V = (\$15{,}000 - \$6{,}500) \div \left[\frac{1}{s\overline{8}|.03} + .07\right] = \$46{,}586.47$$

*Solution with Special Formula*

$$\$15{,}000 - \$6{,}500 = .07V + \frac{V}{s\overline{8}|.03}$$

$$V = \$46{,}586.47$$

**Criticism of Hoskold formula.** *Causes excessive valuations.* It is argued that the use of the Hoskold formula yields a very high valuation to the wasting asset. The use of the Hoskold formula in evaluating wasting assets is not the cause of excessive valuations. Indeed, whenever the safe rate of interest assumed for sinking funds is lower than the speculative rate of interest used, the Hoskold formula (method No. 3) gives a lower valuation than the compound interest actuarial formula (method No. 5).

*Ignores valuation of fixed assets.* The complaint that the Hoskold formula gives a valuation of all assets rather than separate valuations for each class of assets must be admitted, and the use of the Hoskold formula should be limited to cases in which the depreciable assets are not an important element in the total investment. A special formula is available that distinguishes between the classes of assets.[13] Under the Hoskold method, however, depreciation on depreciable assets and a normal return on non-depletable assets may be deducted from the annual income before depreciation and depletion to secure the earnings allocated to deposits.[14]

*Uses imaginary sinking fund.* The Hoskold method, like all of the sinking fund methods of valuing future income, is subject to the objection that sinking funds are seldom accumulated by corporations to replace depletable assets or to return the capital to the investors at the termination of the mining venture. Instead, commercial practice much more frequently reduces the capital through the payment of dividends without separation of the elements of income payment and capital return. The unreality of the sinking fund is liable so to confuse investors that they will be unable to judge the reliability of the assumed periodic income.

*Uses average annual income.* There is a distinct statistical danger in using the usual form of the Hoskold formula, which assumes equal annual income, as deposits frequently become harder to work as they increase in age. This fluctuation in income may be handled by dividing the productive life into blocks, each of which should be separately valued. Of course, the form of the Hoskold formula on page 221 will evaluate fluctuating annual incomes.

**Determination of speculative interest rate.** *Need for rate.* The valuation of future speculative income is its value as safe income multiplied by unity minus a discount factor representing the estimated hazard or risk of loss. Correct evaluation calls for independent, close approximations of the amount of the total income, the dates of receipt of the income, the yield of successful investments of the same type, and the estimated probability of success. Making these estimations separately allows the evaluator to use statistical methods which will bring the probability of error down to

[13] Carman, 16 *American Accountant* 136–139.
[14] Fischer, 16 *American Accountant* 300.

within reasonable limits. As the same degree of hazard does not represent the same speculative rate of interest when applied to investments of different durations, the speculative interest rate must be carefully computed.

*Factor of safety.* The factor of safety, which is equal to unity minus a discount factor representing the estimated hazard or risk of loss, is the quotient of the present worth of future income valued at a speculative rate of interest divided by the present worth of the same future income valued at a safe rate of interest. Grimes and Craigue [15] give tables of factors of safety for valuing equal annual income under valuation methods Numbers 2 to 6, inclusive, when the safe rate of interest is (a) 3, (b) 4, (c) 5, and (d) 6 per cent (the factors of safety under the Hoskold premises are for equal or unequal annual income). The factor of safety for $1 a year for 12 years under the Hoskold premises, when the safe and speculative rates of interest are, respectively, 5 and 8 per cent, is .790. The accuracy of this factor of safety ($F$) can readily be seen from the following:

$$F = \frac{\text{Speculative Value}}{\text{Safe Value}} = \left[\frac{1}{\frac{1}{s_{\overline{12}|.05}} + .08} \div \frac{1}{\frac{1}{s_{\overline{12}|.05}} + .05}\right] = \frac{.58346}{.73860} = .790$$

*Computation of speculative rate.* The use of the tables of factors of safety in computing the speculative rate can be seen from the following problem.

### *Illustrative Problem*

What is the valuation under the compound interest actuarial method of four annual payments of $10 if the safe rate of interest is 5 per cent and the estimated probability is slightly less than 90 per cent?

### *Solution*

Grimes and Craigue [16] show that four equal annual payments, safe interest 5 per cent, have the following factors of safety under the compound interest actuarial method premises:

***Excerpt from Table XX***

| Year | 5% | 6% | 7% | 8% | 9% | 10% | 11% | 12% | etc. | etc. |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 1.00 | .977 | .955 | .934 | .914 | .894 | .875 | .857 | ... | ... |

If .894 is used as a correct enough factor of safety, the valuation would be ($10 $\times$ $a_{\overline{4}|.05}$ $\times$ .894) or $31.70. The accuracy of this valuation can be seen from the following amortization table:

[15] Grimes and Craigue, *op. cit.*, pp. 249–261.
[16] Grimes and Craigue, *op. cit.*, p. 253.

| Year | Cash Dr. | Income Cr. | Investment Cr. | Carrying Value |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $31.70 |
| 1 | $10.00 | $3.17 | $6.83 | 24.87 |
| 2 | 10.00 | 2.49 | 7.51 | 17.36 |
| 3 | 10.00 | 1.74 | 8.26 | 9.10 |
| 4 | 10.00 | .91 | 9.09* | .01* |

* One cent error due to decimals.

**Makeham's formula for valuing loans.** When debts are repayable in any manner other than by a variation of the amortization process, the general formula for the evaluation of loans developed by Makeham, a famous English actuary, may be used. As will be seen later, special classes of loans may be valued by special formulas, but all loans regardless of their manner of repayment may be evaluated by the Makeham formula:

$$A = K + \frac{dD}{iC}(C - K)$$

where $A$ is the value of the loan; $C$, the price at which the loan is to be redeemed; $D$, the original loan or debt; $K$, the present worth of the capital ($C$) repayable by the borrower; $d$, the effective interest rate paid on the unpaid balance of $D$ per conversion period; and $i$, the effective interest rate paid on the investment ($A$) per conversion period.

If the conversion period for $i$ does not coincide with the conversion period for $d$, the former must be expressed in terms of the equivalent rate effective for the conversion period for $d$ before the Makeham formula is used (see solutions to illustrative problems Nos. 5 and 7). When $D$ and $C$ are equal, they may be omitted from the fraction in the second term.

*Illustrative Problem No. 1*

Find the price of 100 bonds, par $1,000 each, 5 per cent nominal rate payable semiannually, due in 3 years, sold to yield 6 per cent nominal rate compounded semiannually.

*Solution*

Here $D = C$ and cancels out of the formula so that

$$A = [\$100{,}000 \times (1.03)^{-6}] + \frac{.025}{.03}\{\$100{,}000 - [\$100{,}000 \times (1.03)^{-6}]\}$$
$$= \$97{,}291.40$$

*Illustrative Problem No. 2*

Find the price of the bonds in Illustrative Problem No. 1 if they yielded the investor 2 per cent semiannually.

*Solution*

$$A = [\$100{,}000 \times (1.02)^{-6}] + \frac{.025}{.02}\{\$100{,}000 - [\$100{,}000 \times (1.02)^{-6}]\}$$
$$= \$102{,}800.72$$

*Illustrative Problem No. 3*

Find the price of the bonds in Illustrative Problem No. 1 if they must be redeemed at $1,020.

*Solution*

$$A = [\$102{,}000 \times (1.03)^{-6}] + \frac{.025 \times 100}{.03 \times 102}\{\$102{,}000 - [\$102{,}000 \times (1.03)^{-6}]\}$$
$$= \$98{,}966.37$$

*Illustrative Problem No. 4*

Find the price of the bonds in Illustrative Problem No. 1 if both of the interest rates were annual instead of semiannual.

*Solution*

$$A = [\$100{,}000 \times (1.06)^{-3}] + \frac{.05}{.06}\{\$100{,}000 - [\$100{,}000 \times (1.06)^{-3}]\}$$
$$= \$97{,}326.99$$

*Illustrative Problem No. 5*

Give the price of $100,000 (par) bonds, due in two years, interest 4 per cent payable annually, yielding 3 per cent per annum, compounded semiannually.

*Solution*

$$A = [\$100{,}000 \times (1.015)^{-4}] + \frac{.04}{(1.015)^2 - 1}\{\$100{,}000 - [\$100{,}000 \times (1.015)^{-4}]\}$$
$$= \$101{,}869.81$$

*Illustrative Problem No. 6*

Find the price of the bonds in Illustrative Problem No. 1 if both of the interest rates were payable (converted) quarterly instead of semiannually.

*Solution*

$$A = [\$100{,}000 \times (1.015)^{-12}] + \frac{.0125}{.015}\{\$100{,}000 - [\$100{,}000 \times (1.015)^{-12}]\}$$
$$= \$97{,}273.12$$

*Illustrative Problem No. 7*

Find the price of the bonds in Illustrative Problem No. 5 if the bond interest was 1 per cent per quarter.

*Solution*

$$A = [\$100{,}000 \times (1.015)^{-4}] + \frac{.01}{(1.015)^{\frac{1}{2}} - 1}\{\$100{,}000 - [\$100{,}000 \times (1.015)^{-4}]\}$$
$$= \$101{,}955.99$$

*Illustrative Problem No. 8*

Find the price of $90,000 (par) irredeemable bonds, interest 2½ per cent half-yearly, sold to yield 3 per cent semiannually.

*Solution*

$$A = [\$90{,}000 \times 0] + \frac{.025}{.03}\{\$90{,}000 - [\$90{,}000 \times 0]\} = \$75{,}000$$

*Illustrative Problem No. 9*

Find the price of \$20,000 (par) serial bonds bearing 3 per cent half-yearly, sold to yield 2 per cent semiannually, maturing \$10,000 in two years and \$10,000 in 3 years.

*Solution*

$$A = \{[\$10{,}000 \times (1.02)^{-4}] + [\$10{,}000 \times (1.02)^{-6}]\} + \frac{.03}{.02}\{\$20{,}000 - [\{\$10{,}000 \times (1.02)^{-4}\} + \{\$10{,}000 \times (1.02)^{-6}\}]\} = \$20{,}940.92$$

*Illustrative Problem No. 10*

Find the price of a serial-plan mortgage, face value \$10,000 payable in 4 equal periodic payments, with interest at 6 per cent effective, sold to yield 7 per cent effective.

*Solution*

$$A = [\$2{,}500 \times a_{\overline{4}|.07}] + \frac{.06}{.07}\{\$10{,}000 - [\$2{,}500 \times a_{\overline{4}|.07}]\} = \$9{,}781.15$$

*Using Makeham formula to approximate rate yielded by loan.* When the rate yielded to the investor is unknown, it may be closely approximated by interpolating between values found by using trial rates for $i$ in the Makeham formula. The choice of trial rates must be made by trial and error until valuations reasonably close to the given valuation have been established.

**Mathematics of periodic debt retirement.** Periodic debt retirement may involve sinking fund installments to pay the debt at maturity or payments to the lendor which represent partly interest and partly payment on principal. The sinking fund installment normally does not include interest on the debt.

*Ordinary sinking fund mathematics.* If $D$ is the money needed in the future to pay the debt, $I$ is the equal periodic payment, $n$ is the number of payments, *soa* is the amount of an ordinary annuity of \$1, and $r$ is the effective interest rate per installment payment period, the formulas for a sinking fund are:

Cash added to fund exclusive of sinking fund income:

$$I = D \div soa \text{ (for } n \text{ periods at } r \text{ rate effective)}$$

Amount added to fund during $t$-th period:

$$AF_t = I \times (1 + r)^{t-1}$$

Balance in fund after $t$ payment periods:

$$BF_t = I \times soa \text{ (for } t \text{ payment periods at } r \text{ rate effective)}$$

*Illustrative Problem*

A debt of $10,000 is due in 4 years and interest earned by fund is 6 per cent per annum, compounded: Case A, annually; Case B, semiannually.

Part 1. Compute the annual cash installment for both cases.

Part 2. In Case A, determine the total added to fund in third year.

Part 3. In Case B, determine the balance in fund at end of third year.

*Annotated Solution*

*Part 1*

$$\text{Case A: } \$10{,}000 \div \frac{(1.06)^4 - 1}{.06} = \$2{,}285.9149$$

$$\text{Case B: } \$10{,}000 \div \frac{(1.03)^8 - 1}{(1.03)^2 - 1} = \$2{,}282.8647$$

*Proof of Accuracy and Borrower's Entries*

| End of Month | Cash Cr. | Income Cr. | Fund Dr. | Fund Balance |
|---|---|---|---|---|
| | | CASE A | | |
| 12 | $2,285.91 | ..... | $2,285.91 | $ 2,285.91 |
| 24 | 2,285.91 | $137.15 | 2,423.06 | 4,708.97 |
| 36 | 2,285.91 | 282.54 | 2,568.45 | 7,277.42 |
| 48 | 2,285.93 | 436.65 | 2,722.58 | 10,000.00 |
| | | CASE B | | |
| 12 | $2,282.86 | ..... | $2,282.86 | $ 2,282.86 |
| 24 | 2,282.86 | $139.03 | 2,421.89 | 4,704.75 |
| 36 | 2,282.86 | 286.52 | 2,569.38 | 7,274.13 |
| 48 | 2,282.88 | 442.99 | 2,725.87 | 10,000.00 |

The Cash Cr. column figures are always *I* as computed by using the formula, except slight adjustments in the last period for errors caused by rounding off decimals. The Income Cr. column accumulates the products of the previous balances in the Fund Balance column multiplied by the effective interest rate per payment period (.06 in Case A and $[(1.03)^2 - 1]$ in Case B). The Fund Dr. column takes the sum of the current Cash Cr. and Income Cr. figures. The Fund Balance column accumulates the current Fund Dr. figures.

If the issuer of the bond closed his books at a time which differs from the sinking fund installment dates, the income should be accrued but the installment payment should not. For instance, if the books were closed in Case A at the end of the 18th month, the entries would be:

| | | |
|---|---|---|
| Accrued Sinking Fund Income | $68.58 | |
| Sinking Fund Income | | $68.58 |
| For half interest for period ending with 24th month. | | |
| Sinking Fund Income | 68.58 | |
| Profit and Loss | | 68.58 |
| To close books. | | |

| | | |
|---|---|---|
| Sinking Fund Income | $68.58 | |
| Accrued Sinking Fund Income | | $68.58 |

To readjust books for next period.

*Part 2*

$AF_3 = \$2{,}285.91 \times (1.06)^2 = \$2{,}568.4484$, which agrees with the third period's figure in the Fund Dr. column for Case A. This formula is very useful in locating errors in long fund-accumulation tables.

*Part 3*

$BF_3 = \$2{,}282.86 \times \dfrac{(1.03)^6 - 1}{(1.03)^2 - 1} = \$7{,}274.1251$, which agrees with the third period's figure in the Fund Balance column for Case B. As the predicted income is not always realized, accountants should compute the amount that should be in the fund at the date of the audit by using this formula.

*Sinking fund when interest rates change.* An American Institute of Accountants examination given some years ago included a problem requiring the computation of the sinking fund installment payments when the interest rate earned by the sinking fund varied. Such problems use special annuity formula No. 1 (see page 216) to determine the amount of an annuity when the interest rate changes.

*Illustrative Problem*

Find the sinking fund installment, payable annually, starting one year hence, needed to raise $10,000 at the end of 5 years, when the effective annual interest rate is 6 per cent for the first 2 years and 5 per cent for the remaining years.

*Solution*

$I = \$10{,}000 \div s_{\overline{5}|.06}$ for 2 years; .05 for 3 years = $1,805.9644 (see page 217 for amount of annuity used as divisor).

**Proof of Accuracy and Borrower's Entries**

| End of Month | Cash Cr. | Income Cr. | Sinking Fund Dr. | Sinking Fund Balance |
|---|---|---|---|---|
| 12 | $1,805.96 | ..... | $1,805.96 | $ 1,805.96 |
| 24 | 1,805.96 | $108.36 | 1,914.32 | 3,720.28 |
| 36 | 1,805.96 | 186.01 | 1,991.97 | 5,712.25 |
| 48 | 1,805.96 | 285.61 | 2,091.57 | 7,803.82 |
| 60 | 1,805.99 | 390.19 | 2,196.18 | 10,000.00 |

*Sinking funds for serial bonds.* Problems involving a sinking fund for bonds maturing at several dates require the periodic sinking fund payment to be computed by:

1. Ascertaining the sum of the compound amounts of the different maturity payments as of the last maturity date, and

2. Dividing this sum by the amount of an ordinary annuity of \$1 for the number of periods of the longest lived bonds.

The computation of the compound amounts as of the last maturity date may always be done by viewing each maturity payment as a sum certain but sometimes annuity formulas may be used conveniently.

*Illustrative Problem*

Find the sinking fund installment which, payable at the end of each period, will retire a debt of \$60,000 due \$10,000 at the end of 4 periods, \$20,000 at the end of 5 periods, and \$30,000 at the end of 6 periods, interest 2 per cent per period effective.

*Solution*

(Method using sums certain)

$$I = \{[\$10{,}000 \times (1.02)^2] + (\$20{,}000 \times 1.02) + \$30{,}000\} \div s_{\overline{6}|.02}$$
$$= \$9{,}639.00$$

(Method using special annuity formula No. 5 — see page 218)

$$I = \left\{\$10{,}000 \times \left[s_{\overline{5}|.02} + \frac{s_{\overline{3}|.02} - 3}{.02}\right]\right\} \div s_{\overline{6}|.02} = \$9{,}639.00$$

**Proof of Accuracy and Borrower's Entries**

| End of Period | Cash Cr. | Income Cr. | Sinking Fund Dr.; Cr.* | Bonds Payable Dr. | Sinking Fund Balance |
|---|---|---|---|---|---|
| 1 | \$9,639.00 | ..... | \$ 9,639.00 | ..... | \$ 9,639.00 |
| 2 | 9,639.00 | \$192.78 | 9,831.78 | ..... | 19,470.78 |
| 3 | 9,639.00 | 389.42 | 10,028.42 | ..... | 29,499.20 |
| 4 | 9,639.00 | 589.98 | 10,228.98 | ..... | 39,728.18 |
| 4 | ..... | ..... | 10,000.00* | \$10,000.00 | 29,728.18 |
| 5 | 9,639.00 | 594.56 | 10,233.56 | ..... | 39,961.74 |
| 5 | ..... | ..... | 20,000.00* | 20,000.00 | 19,961.74 |
| 6 | 9 639.03 | 399.23 | 10,038.26 | ..... | 30,000.00 |
| 6 | ..... | ..... | 30,000.00* | 30,000.00 | ..... |

*Sinking funds when payments vary.* While sinking fund problems involving varying periodic payments are mathematical playthings rather than practical problems, their study is worth while in order to increase the student's knowledge of the principles underlying both annuities and sinking funds. The most probable forms of such problems are:

1. One or more payments fixed in size before the ordinary payments are computed
2. Changing payments remain constant multiples of starting sum
3. Payments form geometric series
4. Some payments a fixed sum more than the others
5. Payments form arithmetic series

The different cases in the following problem include most of the points in the sinking fund problems given on C.P.A. examinations.

*Illustrative Problem*

Find the installments to be paid into a sinking fund to cancel a debt of $10,000 at the end of 4 years, if interest is 6 per cent per annum effective and if the installments, payable at the end of each year:

Case A. Are $2,000 the first year and $2,200 the fourth year.

Case B. Are twice as much the third and fourth years as they are the first and second years.

Case C. Double annually.

Case D. Are $1,000 more the third and fourth years than they are the first and second years.

Case E. Are annually increased by 20 per cent of the initial payment.

*Solution*

CASE A

$$I = \{\$10{,}000 - ([\$2{,}000 \times (1.06)^3] + \$2{,}200)\} \div [s_{\overline{2}|.06} \times 1.06] = \$2{,}481.2099$$

(Note that the 2-period annuity is an annuity due.)

CASE B

$$\{[I \times s_{\overline{2}|.06}] \times (1.06)^2\} + [2I \times s_{\overline{2}|.06}] = \$10{,}000$$

Solving, $I = \$1{,}554.0943$; $2I = \$3{,}108.1886$

CASE C

Using special annuity formula No. 3 to determine $(vs)_{\overline{4}|.06}$ when $w$ is 2,

$I = \$10{,}000 \div 15.678216$ (see page 217) $= \$637.82767$

$2I = \$1{,}275.6553$; $4I = \$2{,}551.3106$; $8I = \$5{,}102.6213$

CASE D

$$\$10{,}000 = [I \times s_{\overline{4}|.06}] + [\$1{,}000 \times s_{\overline{2}|.06}]$$

$I = \$1{,}815.0164$; $I + \$1{,}000 = \$2{,}815.0164$

CASE E

Using special annuity formula No. 5 to determine $(vs)_{\overline{4}|.06}$ when $d$ is .20,

$I = \$10{,}000 \div 5.623336$ (see page 218) $= \$1{,}778.30383$

$1.2I = \$2{,}133.9645$; $1.4I = \$2{,}489.6253$; $1.6I = \$2{,}845.2861$

*Amortization of debt.* Amortization of debt means the extinction of the liability, principal and interest (if any), by a series of equal periodic payments. The amortization of a debt differs from the ordinary funding of a liability as to the following:

1. The principal of the debt decreases under the amortization process and remains constant under the funding program.

2. The amortization payment includes interest on principal while the

ordinary sinking fund installment does not. The amortization process really is a special form of the sinking fund procedure in which the installments are invested with the creditor instead of with a third party.

All amortization problems involve a known debt due at a specified time and two effective rates of interest; i.e., the debt bears $d$ per cent per amortization payment period and the payments bear $p$ per cent per amortization payment period. If the interest rates given are not expressed in terms of the amortization payment period, these rates must be converted into effective rates per amortization payment period. There are three basic variations in amortization of debt problems:

1. When $d$ is equal to zero; i.e., the debt is noninterest bearing
2. When $d$ and $p$ are equal
3. When $d$ and $p$ are not equal

If $D$ is the debt to be amortized and the other symbols have their usual meanings, the formulas for debt amortization are:

Cash paid by debtor to creditor:

$$I = [D \div soa \text{ (for } n \text{ periods at } p \text{ rate effective)}] + dD$$

Debt paid with $t$-th amortization payment:

$$AD_t = (I - dD) \times (1 + p)^{t-1}$$

Unpaid debt after $t$-th amortization payment:

$$UD_t = D - [(I - dD) \times soa \text{ (for } t \text{ periods at } p \text{ rate effective)}]$$

### *Illustrative Problem*

If a debt of \$10,000 is to be amortized in 4 equal payments due at the end of each year and the payments are allowed interest at 6 per cent per annum effective, and the debt bears: Case A, zero; Case B, 6; and Case C, 7 per cent interest per annum effective:

Part 1. Compute the annual payment.

Part 2. Compute the debt retired by the third payment.

Part 3. Compute the debt unpaid after the second payment.

### *Annotated Solution*

#### *Part 1*

$$\text{Case A: } I = \left[\$10{,}000 \div \frac{(1.06)^4 - 1}{.06}\right] + [0 \times \$10{,}000] = \$2{,}285.9149$$

$$\text{Case B: } I = \left[\$10{,}000 \div \frac{(1.06)^4 - 1}{.06}\right] + [.06 \times \$10{,}000] = \$2{,}885.9149$$

$$\text{Case C: } I = \left[\$10{,}000 \div \frac{(1.06)^4 - 1}{.06}\right] + [.07 \times \$10{,}000] = \$2{,}985.9149$$

**Proof of Accuracy and Entries of Debtor and Creditor**

CASE A

| End of Month | Cash Cr. | Income Cr. | Debt Dr. | Prepayment Balance | Debtor's Entries |
|---|---|---|---|---|---|
| End of Month | Cash Dr. | Expense Dr. | Debt Cr. | Prepayment Balance | Creditor's Entries |
| 12 | $2,285.91 | ..... | $2,285.91 | $ 2,285.91 | |
| 24 | 2,285.91 | $137.15 | 2,423.06 | 4,708.97 | |
| 36 | 2,285.91 | 282.54 | 2,568.45 | 7,277.42 | |
| 48 | 2,285.93 | 436.65 | 2,722.58 | 10,000.00 | |

CASE B

| End of Month | Cash Cr. | Expense Dr. | Debt Dr. | Debt Balance | Debtor's Entries |
|---|---|---|---|---|---|
| End of Month | Cash Dr. | Income Cr. | Debt Cr. | Debt Balance | Creditor's Entries |
| 0 | ..... | ..... | ..... | $10,000.00 | |
| 12 | $2,885.91 | $600.00 | $2,285.91 | 7,714.09 | |
| 24 | 2,885.91 | 462.85 | 2,423.06 | 5,291.03 | |
| 36 | 2,885.91 | 317.46 | 2,568.45 | 2,722.58 | |
| 48 | 2,885.93 | 163.35 | 2,722.58 | ..... | |

CASE C

| End of Month | Cash Cr. | Expense* Dr. | Debt Dr. | Prepayment Balance | Debtor's Entries |
|---|---|---|---|---|---|
| End of Month | Cash Dr. | Income* Cr. | Debt Cr. | Prepayment Balance | Creditor's Entries |
| 12 | $2,985.91 | $700.00 | $2,285.91 | $ 2,285.91 | |
| 24 | 2,985.91 | 562.85 | 2,423.06 | 4,708.97 | |
| 36 | 2,985.91 | 417.46 | 2,568.45 | 7,277.42 | |
| 48 | 2,985.93 | 263.35 | 2,722.58 | 10,000.00 | |

* If in Case C $p$ exceeds $d$, debtor credits Income and creditor debits Expense.

The Expense-Income figures, which are the only figures not self-explanatory, are the product of $p$ multiplied by the previous prepayment balance in Case A and by the previous debt balance in Case B. The Case C table may be obtained by adding $[D \times (d - p)]$ to the figures in the first and second money columns in the Case B table.

If the debtor and creditor closed their books off the amortization installment dates, the interest should be accrued but the installment payment should not. For instance, if the creditor closed his books in Case C at the end of the 18th month, his entries would be:

| | | |
|---|---|---|
| Accrued Interest Receivable . . . . . | $281.42 | |
| Interest Income . . . . . | | $281.42 |
| For half of interest for period ending with 24th month. | | |

| | | | | |
|---|---|---|---|---|
| Interest Income | | | $631.42 | |
| Profit and Loss | | | | $631.42 |
| To close books: | | | | |
| Interest received | $700.00 | | | |
| Less half pertaining to previous period | 350.00 | $350.00 | | |
| Plus accrued interest | | 281.42 | | |
| | | $631.42 | | |
| Interest Income | | | 281.42 | |
| Accrued Interest Receivable | | | | 281.42 |
| To readjust books for next period. | | | | |

*Part 2*

Case A: $AD_3 = [\$2{,}285.91 - (0 \times \$10{,}000)] \times (1.06)^2 = \$2{,}568.45$

Case B: $AD_3 = [\$2{,}885.91 - (.06 \times \$10{,}000)] \times (1.06)^2 = \$2{,}568.45$

Case C: $AD_3 = [\$2{,}985.91 - (.07 \times \$10{,}000)] \times (1.06)^2 = \$2{,}568.45$

*Part 3*

$$\text{Case A: } UD_2 = \$10{,}000 - \left\{[\$2{,}285.91 - (0 \times \$10{,}000)] \times \frac{(1.06)^2 - 1}{.06}\right\}$$
$$= \$5{,}291.03$$

$$\text{Case B: } UD_2 = \$10{,}000 - \left\{[\$2{,}885.91 - (.06 \times \$10{,}000)] \times \frac{(1.06)^2 - 1}{.06}\right\}$$
$$= \$5{,}291.03$$

$$\text{Case C: } UD_2 = \$10{,}000 - \left\{[\$2{,}985.91 - (.07 \times \$10{,}000)] \times \frac{(1.06)^2 - 1}{.06}\right\}$$
$$= \$5{,}291.03$$

When amortization tables are long, every tenth Balance figure should be checked by using the $UD_t$ formula. If the result by the formula does not agree with the Balance figure in Case B or with the excess of the original debt over the Balance figure in Case A and Case C, the error within the 10-year period should be located by using the $AD_t$ formula.

*Special debt amortization formulas.* When the amortization and interest conversion periods coincide and the interest rates are effective, the following formulas may be used:

When debt is noninterest bearing and payments bear $p$ rate of interest:

$$\text{Formula No. 1: } I = D \div s_{\overline{n}|p}$$

When debt and payments bear $p$ rate of interest:

$$\text{Formula No. 2: } I = D \div a_{\overline{n}|p}$$

When debt bears $d$ and payments $p$ rate of interest:

$$\text{Formula No. 3: } I = D(d - p) + [D \div a_{\overline{n}|p}]$$

These special formulas may be readily derived from the general formula given above. Formula No. 2 is quite important because it has been used in C.P.A. problems. Formulas Nos. 1 and 2 are found in all textbooks on

mathematics of finance, but, strangely enough, formula No. 3 is seldom given.

*Redemption money.* The amount which must be paid at any time to liquidate the debt in one lump sum depends on the agreed-upon interest rate to be used in cancellation. The selection of a current effective interest rate per amortization payment period depends upon the bargain made by the lender and the borrower and will, therefore, reflect the market rate of interest carried at that time by similar loans adjusted somewhat by the effect of the relative bargaining power of the two parties. The general formula for the redemption of unpaid amortization payments is:

$$RM_t = I \times poa \text{ (for } (n - t) \text{ payments at } c \text{ rate effective)}$$

***Illustrative Problem***

After the first amortization has been made on the debt in the above problem, what lump sum is needed to liquidate the debt if the agreed-upon current interest rate is 5 per cent per annum effective?

*Solution*

Case A: $RM_1 = \$2{,}285.91 \times a_{\overline{3}|.05} = \$6{,}225.10$

Case B: $RM_1 = \$2{,}885.91 \times a_{\overline{3}|.05} = \$7{,}859.05$

Case C: $RM_1 = \$2{,}985.91 \times a_{\overline{3}|.05} = \$8{,}131.37$

*Sinking fund pays bond interest.* Sinking funds are sometimes required to pay the interest on the debt as well as finally to retire the debt. The mathematics of this rather unusual type of sinking fund is identical with that of the amortization of an interest-bearing debt when $d$ and $p$ are equal.

***Illustrative Problem***

Tabulate the debtor's entries if a sinking fund is to retire \$10,000 in 4 years and to pay the interest on the debt. Both the debt and fund have an interest rate of 6 per cent per annum effective.

*Solution*

$$I = [\$10{,}000 \div s_{\overline{4}|.06}] + [.06 \times \$10{,}000] = \$2{,}885.91$$

| End of Year | Cash Cr. | Interest Income Cr. | Fund Dr. | Interest Expense Dr. | Fund Cr. | Fund Balance |
|---|---|---|---|---|---|---|
| 1 | \$2,885.91 | ..... | \$2,885.91 | \$600.00 | \$600.00 | \$ 2,285.91 |
| 2 | 2,885.91 | \$137.15 | 3,023.06 | 600.00 | 600.00 | 4,708.97 |
| 3 | 2,885.91 | 282.54 | 3,168.45 | 600.00 | 600.00 | 7,277.42 |
| 4 | 2,885.93 | 436.65 | 3,322.58 | 600.00 | 600.00 | 10,000.00 |

**Annuities as investments.** When a person loans money to be repaid on the amortization plan, he is buying an annuity having $d$ and $p$ interest rates equal. Special debt amortization formula No. 2 (see page 238) applies to purchased annuities. Interest tables, which were compiled before the age of calculating machines, frequently give tables of "annuity which fig. 1

will buy." This table gives the reciprocals of $a_{\overline{n}|i}$; consequently, it replaces the process of division by the multiplication technique. The amortization table for a purchased annuity follows the creditor's portion of the table for amortizing a debt when $p$ and $d$ are equal (see Case B on page 237).

*Deferred annuities purchased with equal premiums payable at regular intervals.* When an insurance company sells a deferred annuity to a policyholder who is to pay for the policy by making installment payments, the present worth of the premiums (either an ordinary annuity or an annuity due) is equal to the present worth of the future payments to be made by the insurance company (either a deferred ordinary annuity or a deferred annuity due).

*Illustrative Problem*

Find the annual premium, payable in advance for 4 years, required to provide an annuity for 3 years, the first annual payment of $10,000 to be made at the end of 4 years, interest 6 per cent per annum effective.

*Solution*

$$I \times [a_{\overline{4}|.06} \times 1.06] = \$10{,}000 \times a_{\overline{3}|.06} \times (1.06)^{-3}$$

$$I = \$6{,}110.2777$$

**Proof of Accuracy and Investor's Entries**

| Start; End* of Month | Cash Dr. | Cash Cr. | Income Cr. | Annuity Dr.; Cr.* | Annuity Balance |
|---|---|---|---|---|---|
| 1 | ..... | $6,110.28 | ..... | $6,110.28 | $ 6,110.28 |
| 13 | ..... | 6,110.28 | $ 366.62 | 6,476.90 | 12,587.18 |
| 25 | ..... | 6,110.28 | 755.23 | 6,865.51 | 19,452.69 |
| 37 | ..... | 6,110.27 | 1,167.16 | 7,277.43 | 26,730.12 |
| 48* | $10,000.00 | ..... | 1,603.81 | 8,396.19* | 18,333.93 |
| 60* | 10,000.00 | ..... | 1,100.04 | 8,899.96* | 9,433.97 |
| 72* | 10,000.00 | ..... | 566.03 | 9,433.97* | ..... |

**Perpetuities as investments.** The periodic payment of a perpetuity, which may be purchased for a given sum, is the quotient of that sum divided by the present worth of a perpetuity of $1 under the given conditions.

*Illustrative Problem*

Find the annual payments of a perpetuity (such as British consols) which a college may purchase for $80,000, interest 6 per cent per annum effective.

*Solution*

$$I = \$80{,}000 \div \frac{1}{.06} = \$4{,}800.00$$

The college's entries for the receipt of the interest payments would be:

| | | |
|---|---|---|
| Cash | $4,800.00 | |
| Interest Income | | $4,800.00 |

because the value of the perpetuity remains constant and no principal is returned with the periodic payments.

# CHAPTER 8

## Accounting for Securities

**Introduction.** Since the ownership of securities is widespread, the accounting problems associated with them constitute a constant challenge to the accountant. In this chapter, however, only the more involved and complicated types of transactions will be discussed and illustrated; the student, it is assumed, is already familiar with the more elementary aspects of the accounting for securities.

The term "securities" as used in this chapter has a broad meaning and includes the usual bonds and stocks as well as mortgages, leaseholds, and long-term notes. The discussion also encompasses the mathematics underlying the journalization of the transactions. In addition, the several sections of the chapter treat practically all of the points involving securities which the candidate for professional accounting examinations is expected to be able to handle.

The reader is referred to Chapter 6 for a comprehensive discussion of the subject of dividends; this matter, of course, is closely related to the accounting for securities owned by corporate or individual investors. Chapter 6, for example, treats such topics as the sources of dividends and the entries to be made by the corporation which declares the dividend.

Included in this chapter is a considerable amount of material on the taxation of the income from securities, especially dividends received by an investor on stock which he owns in a private corporation. The authors believe this emphasis is warranted since there has been over the past thirty years a definite mutually reciprocal influence between the taxation of, and the accounting for, dividends. Because of the significance of taxation the next several sections are devoted to the matter.

**Taxation of dividends — general.** Ever since the modern income tax law was first enacted by Congress, questions have arisen as to the taxation of dividends which may be declared and paid to the stockholders of the corporation. While the corporation itself pays an income tax into the government treasury, fiscal policy has almost continually called for another tax to be paid by the stockholders when and if the board of directors decide to distribute some of the remaining income to the owners. There are, however, two important provisos associated with the taxability of the dividends received by the owners (excluding the problems of stock dividends discussed later in this chapter): Corporate distributions are considered to be taxable only (1) if they are paid out of "earnings and profits" accumulated since February 28, 1913, or (2) if they are paid out

of "earnings and profits" of the current taxable year.[1] These provisions exclude from the taxable group those distributions which are in fact (a) completely or partially liquidating in their effect, or (b) where they are simply exchanges of stock for stock.[2] In general, where a distribution is not taxable to the stockholder, it serves to reduce the cost or other basis of his stock and thus may influence the gain or loss on the eventual disposition of the stock.[3]

Even though, as noted above, there is great emphasis on "earnings and profits" in determining the taxability of any corporate distribution, nowhere in the law or regulations is that expression especially defined or described. When questions arise concerning its interpretation, there is considerable reliance on accepted accounting standards as they relate to surplus classification (see Chapter 4); but there are certain dissimilarities between the income tax considerations and recognized accounting practices.[4] Some of these are brought out in the discussion below.

Ordinary payments (including premiums) made by stockholders for their shares are not part of the earnings and profits of the corporation,[5] but in at least one circumstance a corporation may declare a taxable dividend even though only paid-in surplus exists on the books of the enterprise. The circumstance referred to is the rule which has been in effect since 1936; it provides that if the corporation has made a profit for the current year sufficient to cover the dividend, the distribution shall be taxable even though a deficit in earned surplus existed as of the beginning of the fiscal year.[6] This is definitely contrary to the accepted accounting standard; under the latter the distribution would be a return of investment to the owners.

In regard to property donated to the corporation by nonstockholders, the income tax rule is that any gain or loss on the subsequent disposal of such property will affect the "earnings and profits" available for taxable distributions.[7] This same rule also applies where the stockholders, who are also bondholders, surrender their holdings of bonds to the corporation.[8] Ordinarily, this type of surplus would be classified as paid-in since it arises from dealings with stockholders, but it still would give rise to surplus from which taxable distributions could be made.

Treasury stock transactions (see Chapter 3) also may give rise to "earn-

[1] Internal Revenue Code, Section 115(a).
[2] Internal Revenue Code, Sections 115(c)(d).
[3] Regulations 111, Section 29.115–4; *Ayer v. Commissioner*, 100 Fed. (2nd) 850; *Shield Co.*, 2 T.C. 763.
[4] Emmanuel, 4 *Tax Law Review* 494.
[5] *W. S. Farish & Co.*, 38 B.T.A. 150; aff'd, 104 Fed. (2nd) 833.
[6] *V. U. Young*, 6 T.C. 357.
[7] Regulations 111, Section 29.115–11.
[8] I.T. 1924, III-1 C.B. 27.

ings and profits" from the income tax viewpoint if it is proved that the corporation has traded in its own shares as if they were the shares of another corporation.[9] This is true even though the corporation follows the accepted accounting standard and never credits Earned Surplus account for the transactions in treasury stock.[10]

Transactions which come up in connection with the appraisal of corporate property subsequent to its acquisition (see Chapter 11) do not cause any "earnings and profits" to arise even though accompanied by a quasi-reorganization.[11] The same rule is followed in those cases where appreciated assets are distributed to stockholders as a property dividend; that is, it is

of "earnings and profits"; the latter are even unaffected by the setting up of discovery value resulting from a bona fide lucky acquisition of a mine, which is found to contain much more than was anticipated at the time of purchase.[13]

The question of the effect of stock dividends on the amount of "earnings and profits" derived since 1913 has been stressed on several occasions in court decisions. For instance, where a corporation (1) declared and issued a stock dividend which was nontaxable to the stockholders (discussed later in this chapter), (2) later reduced the par value of the entire group of shares, and (3) later distributed the resulting paid-in surplus to the stockholders in cash it was decided by the court that the "earnings and profits" still existed; the cash dividend thus was taxable in full to the recipients.[14] Also, simply increasing the stated value of no-par stock by transferring sums from earned surplus does not reduce "earnings and profits."[15]

Some other pertinent points are briefly digested below:

1. Interest or other revenue from tax-exempt securities and miscellaneous sources must be added to the "earnings and profits" available for a taxable distribution.

2. The write-off (or amortization) of organization costs does not reduce "earnings and profits."

3. The amortization of goodwill having an indefinite life does not reduce "earnings and profits."

[9] *Commissioner v. Batten, Barton, Durstine & Osborn, Inc.*, 171 Fed. (2nd) 474; *Helvering v. Reynolds Co.*, 306 U.S. 110.
[10] *First Chrold Corp. v. Commissioner*, 97 Fed. (2nd) 22.
[11] *La Belle Iron Works v. U.S.*, 356 U.S. 377; *Saven Corp.*, 45 B.T.A. 343.
[12] *V. U. Young*, 5 T.C. 1251; *General Utilities v. Helvering*, 296 U.S. 200.
[13] *R. D. Merrill Co.*, 4 T.C. 955; Internal Revenue Code, Section 114(b)(2).
[14] *Long v. Commissioner*, 155 Fed. (2nd) 847.
[15] *F. J. Young Corp.*, 35 B.T.A. 860.

4. An intercompany dividend increases the "earnings and profits" of the recipient corporation.

5. Contributions paid out by a corporation, which may be only partially deductible for income tax purposes, nevertheless reduce "earnings and profits" by the full amount of the outlay.

6. Income taxes paid by the corporation, which are not deductible in computing the tax itself, nevertheless reduce "earnings and profits" by the full amount of the tax accrual.

7. All charges for depreciation and depletion, which are in excess of the income tax deduction for these items, do *not* reduce "earnings and profits."

8. Some companies are allowed by statute to charge off depletion for income tax purposes on the basis of a stated percentage of gross revenue or a stated percentage of income from the property. For the purpose of determining "earnings and profits," however, the charge-off for depletion must be measured in accord with the general rule, that is, a proportion of the cost of the property dependent upon the physical amount of mineral extracted.

9. In regard to tax-exempt bonds purchased at a premium, the premium must be amortized over the life of the bonds, but such amortization has no effect on "earnings and profits."

10. In case a corporation successfully pleads the statute of limitations on an obligation due by it to another party, such pleading gives rise to "earnings and profits."

11. Cash paid to stockholders, which may be charged to the Reserve for Depletion account on the books of the corporation, has no effect on "earnings and profits" since such distributions are viewed as partially liquidating in nature.[16]

12. The setting up of a Reserve for Contingencies (see Chapter 5) does not reduce the amount of "earnings and profits." [17]

13. A dividend declared by a corporation reduces the "earnings and profits" on the declaration date rather than the payment date. In one case, where a corporation delayed the payment for three years after the dividend was declared this question became very important. There were ample accumulated "earnings and profits" at the time of declaration to cover the dividend, but subsequent losses before payment reduced the accumulated surplus to a point where the payment of the dividend might have been a voluntary reduction of capital. The court stated: [18]

We think the problem presented is primarily one of accounting in the absence of the application of Section 115 IRC. The question is simply whether it was proper to charge surplus and current earnings with the amount of the dividend in the fiscal year ended June 30, 1931, the year it was declared, in order to accurately

[16] Regulations 111, Section 29.115–6.
[17] *Paulina duPont Dean*, 9 T.C. 256.
[18] *Commissioner v. Goldwyn*, CCA — (9), No. 12,037, June 20, 1949.

reflect the financial status of the corporation. Thus stated it is apparent that what is sought is the financial structure of a corporate organization at a given time, an accurate presentation of which is the very purpose and function of accounting. We find support for this analysis in rulings of the Treasury Department. Regulations 111, Section 29.115-3 states: "In determining the amount of earnings or profits . . . due consideration must be given to the facts, and, while mere bookkeeping entries increasing or decreasing surplus will not be conclusive, the amount of the earnings or profits in any case will be dependent upon the method of accounting properly employed in computing net income." Also, see I.T. 3758, C.B. 1945, p. 159. In *Commissioner v. James,* 49 Fed. (2nd) 707, 708, it is stated that: "In employing the phrase 'earnings and profits' in Section 115, we think Congress intended the use of the term in the ordinary accounting understanding . . ."

The Commissioner cites many cases holding that book entries or accounting practices are not controlling in tax matters. We do not question the accuracy of those decisions. They involve issues as to whether certain transactions come within the import of various code sections. Of course, what an accountant or bookkeeper enters in the books in a given case does not govern the applicability of statutory provisions. Such entries, however, may have evidentiary value. To say that book entries control would permit tax statutes to be circumvented by skillful accountants. In the instant case no tax dodging scheme is involved. The substance of a transaction, rather than its book entries, determines its taxability. We are not here concerned with the taxability of the transactions between 1930 and 1933. The tax consequences of the 1930 declaration did not manifest themselves for 12 years, and were wholly unpredictable in 1930. As we have stated, application of Section 115(a) is not involved here. The determination of the amount of capital and surplus levels of the corporation in 1930 and 1933 depends solely on an accurate accounting of corporate assets and liabilities at those times.

With the issue thus defined its resolution becomes clear. It is well settled that the declaration of a dividend incurs a debtor-creditor relationship between the corporation and its shareholders. *Commissioner v. Scatena,* 85 Fed. (2nd) 729, 731. *U.S. v. Guinzburg,* 278 Fed. 363. See also, *Commissioner v. Miller Mill Co.,* 102 Fed. (2nd) 599, a case arising under the Internal Revenue Code. Accountants uniformly follow the logical consequence of the relationship thus created by immediately reducing surplus and current earnings and crediting accounts payable by the proper amount. See W. A. Paton, *Accountants' Handbook,* 3rd Ed., pp. 1041, 1042. It would be an inaccurate reflection of the corporation's financial standing to list an amount as surplus which in fact was due and owing under a legally enforceable obligation. The Securities and Exchange Commission follows the same rule in its uniform system of accounts. Regulation S-X of S.E.C., Art. 5, Rule 5.02, Sub. 25, 3 CCH Fed. Sec. Law Service, paragraphs 69242 and 70311. To similar effect see *Gregg Co.,* 25 B.T.A. 81; *Gelmont Iron Works,* 9 B.T.A. 216; *W. E. Caldwell Co.,* 6 B.T.A. 47; *Bulger Black Coal Co. v. U.S.,* 48 Fed. (2nd) 675. The corporation correctly reflected its accumulated and current earnings as reduced by the amount of the dividend in 1930.

**Stock dividends.**[19] *Nontaxable and taxable.* The question of what constitutes a taxable stock dividend is still partially unsettled in spite of numerous rulings on the following specific points:

[19] For legal and financial aspects of stock dividends see Kerrigan, 11 *Accounting Review* 373-383; (1937) Montgomery 606-611; Alvord, 64 *Journal of Accountancy* 419-421.

1. Where a stock dividend gives the stockholder an interest identical with that which his former stockholdings represented, he does not receive taxable income;[20] otherwise he does receive taxable income.[21]

2. A dividend in common stock paid on preferred stock is taxable if both classes of stock are already outstanding and are not held proportionately by the same stockholders.[22]

3. A dividend in preferred stock paid on common stock when other preferred stock is outstanding is taxable if both classes of stock are not held proportionately by the same stockholders.[23]

4. A dividend in preferred stock paid on common stock when no other preferred stock is outstanding is not taxable.[24]

5. Dividends payable in the stock of a corporation other than the one declaring the dividend are taxable.[25]

6. Dividends payable in either cash or stock of the issuing corporation at the option of the shareholder are taxable.[26]

7. Preferred and common shares issued for old common shares (no preferred then outstanding) and the capitalization of earned surplus are not taxable.[27]

8. When shares are issued as a dividend with a provision that a given percentage will be redeemed at the stockholders' option at a set price per share, the receipts from such redemption are taxable, but the shares not redeemed are a true stock dividend.[28]

9. Dividends payable in scrip certifying that the corporation will issue a stated amount of common stock at a date to be fixed by the directors is a nontaxable stock dividend.[29]

10. Fractional shares frequently arise in connection with stock dividends. If the stock represented by fractional shares is to be united into whole shares and sold for the benefit of the stockholders, the fractional shares are treated as a nontaxable stock dividend.[30] If no stock was authorized to cover the fractional shares and if cash is distributed in lieu of the distribution of the fractional shares of stock, the fractional shares constitute a taxable cash dividend.

11. Transfer from the Earned Surplus to the Capital Stock account to

[20] *Eisner v. Macomber*, 252 U.S. 189.
[21] *Corinne S. Koshland v. Helvering*, 298 U.S. 441.
[22] *Ibid.; Commissioner v. Tillotson Mfg. Co.*, 76 Fed. (2nd) 189.
[23] *James H. Torrens*, 31 B.T.A. 787 (NA); *Edward P. Hamilton*, 32 B.T.A. 820.
[24] *Helvering v. Strassburger*, 318 U.S. 604.
[25] *Peabody v. Eisner*, 247 U.S. 347.
[26] T.D. 3052, III C.B. 38; *William H. Jackson*, 12 B.T.A. 234.
[27] *Pearl B. Brown*, 26 B.T.A. 901.
[28] I.T. 2493, VIII-2 C.B. 133.
[29] I.T. 1930, III-1 C.B. 39.
[30] O.D. 781, IV C.B. 28.

settle the uncalled portion of the par value of outstanding stock is a nontaxable stock dividend.[31]

12. The exchange of old common stock for preferred stock and an increased amount of common in the same proportion as the old common stock is held to be a nontaxable stock dividend; the cost basis of the old common stock should be allocated according to the relative sales value of the new common and preferred.[32]

*Receipt of stock dividends.* Nontaxable stock dividends payable in precisely the same stock as that already held by the distributee merely reduce the tax basis of the old stock per share by increasing the size of the divisor without changing the total tax basis. If shares are received as dividends upon several lots of identical stock, they must be applied to each lot of old stock, as subsequent sales of shares must be priced either upon the first-in, first-out principle, or upon the specific cost principle.[33] Nontaxable stock dividends payable in stock not precisely the same as old stock should be set up as a separate investment and the tax basis of the old stock prior to the stock dividend should be allocated to the new stock and the old stock in proportion to their relative market values at the time of the stock dividend.[34]

*Fractional shares.* The problems concerning the fractional shares due to stock dividends are similar to those caused by the fractional shares after stock splits. When fractional shares are purchased to round out fractions, the amount paid becomes a part of the cost of the new shares. Fractional shares sold have their proportionate part of the tax basis of the investment before the stock dividend.[35]

**Property dividends.** *General.*[36] Care must be taken in wording the declaration of dividends distributing property to stockholders. If the declaration prescribes a dividend payable in property, there is no income adjustment to the corporation; the book value of the assets is merely debited to Earned Surplus and credited to the asset accounts affected.[37] If the declaration is stated in terms of money and then property is distributed in payment thereof, the transaction involves a taxable profit to the corporation if the fair market value of the assets at the date of distribution exceeds their cost, or it involves a taxable deduction if the cost of the assets exceeds their fair market value at the date of the dividend.[38] In either case, the property

[31] I.T. 2455, VIII–1 C.B. 218.
[32] *Frances Elliott Clark*, 28 B.T.A. 1225.
[33] *Fuller v. Commissioner*, 81 Fed. (2nd) 176.
[34] O.D. 732, III C.B. 39.
[35] O.D. 859, IV C.B. 24.
[36] For general legal discussion see Briggs, 7 *Accounting Review* 169–174; Nelson, 91 *Journal of Accountancy* 96.
[37] *First Savings Bank of Ogden v. Burnet*, 53 Fed. (2nd) 919.
[38] *Callahan Road Improvement Co.*, 12 B.T.A. 1109; *Bacon-McMillan Veneer Co.*, 20 B.T.A. 556.

received must be included at its fair market value in the taxpayer's taxable income for the year in which the property was unqualifiedly made subject to his demand,[39] limited, however, to a prorata share of the corporation's income since March 1, 1913.[40] Property dividends may be paid in the stock or bonds of another corporation, government bonds, lots of real estate, stocks of liquor, and the like.

The use of property dividends to avoid corporate taxes is practically limited to closely held corporations, for, if property is distributed to a trustee for sale, the proceeds to be distributed to the stockholders, the sale will be imputed to the corporation.[41]

*Payable in treasury stock.* While the courts sometimes hold that dividends payable in treasury stock are property dividends,[42] such distributions should be thought of as stock dividends as that is their status for income tax purposes.[43]

*Payable in scrip.*[44] Scrip for fractional shares connected with a stock dividend is the same as a stock dividend.[45] Scrip redeemable in cash or stock at the option of the stockholder is taxable as a cash dividend if actually redeemed in cash, or as a property dividend for the fair market value of the stock distributed if redeemed in stock.[46] Interest-bearing notes issued as a scrip dividend are taxable at their fair market value; subsequent sale or surrender for cash may result in either a taxable gain or deductible loss.[47] Interest paid on notes issued as a scrip dividend is a deductible expense to the distributor in the year of payment.[48] Normally, scrip dividends are taxable to the distributee in the year the warrants are issued,[49] but insurance scrip dividends on which the ultimate amount to be paid depended upon the expenses and losses of the insurance company have been held reportable as income in the year of payment.[50] Unpaid scrip should be shown on the balance sheet as a liability if redeemable in cash and as an addition to stock outstanding if redeemable in stock.

*Payable in bonds.* Dividends payable in the nonconvertible bonds of the issuer rate as a property dividend to both the distributor and distributee.[51] No ruling is available on convertible bonds received as divi-

[39] Regulations 111, Section 29.42–3 and Section 29.115–10.
[40] *U.S. v. Fuller*, 42 Fed. (2nd) 471.
[41] *Northwest Utilities Securities Corporation v. Helvering*, 67 Fed. (2nd) 619.
[42] *Leland v. Layden*, 102 Mass. 542; *Green v. Bissell*, 70 Conn. 547.
[43] I.T. 2449, VIII–1 C.B. 101.
[44] For general legal discussion see Briggs, 13 *Certified Public Accountant* 30–34.
[45] O.D. 859, IV C.B. 24.
[46] Revenue Act of 1938, Section 115(f) and (j).
[47] O.D. 471, II C.B. 26.
[48] O.D. 778, IV C.B. 141.
[49] Regulations 111, Section 29.115–10.
[50] O.D. 589, III C.B. 37.
[51] *Doerschuck v. U.S.*, 274 Fed. 739, published as T.D. 3170, IV C.B. 25; *U.S. v. Fuller*, 42 Fed. (2nd) 471; *Adams*, 5 Tax Court No. 40 (1945).

dends. The writers believe they would not constitute taxable income because the rights to subscribe for convertible bonds do not constitute taxable income,[52] while rights to subscribe for nonconvertible bonds do constitute income up to their fair market value.[53]

**Date dividend is taxable.** This is an important matter in some instances, but since the rules are treated at length in Chapter 6 (especially on page 194) they do not require further elaboration at this point.

**Passed cumulative dividends at acquisition.** While passed cumulative dividends at date of acquisition of stock should logically be treated as a return of investment when received,[54] this refinement is usually ignored for the following reasons:

1. Passed cumulative dividends at date of acquisition are taxable income for the year of receipt.[55]

2. Passed cumulative dividends at date of acquisition are usually discounted very heavily by investors. If the passed cumulative dividends have been discounted, a parent controlling a subsidiary's common stock would eliminate on the consolidating work sheet its holdings in the subsidiary's nonparticipating preferred stock by the following entry:[56]

| | | |
|---|---|---|
| Preferred Capital Stock (for par of intercompany preferred stock) | $.... | |
| Earned Surplus (for passed cumulative dividends at date of acquisition whether received or not) | .... | |
| Investment in Subsidiary's Preferred Stock (for cost thereof) | | $.... |
| Surplus from Consolidation | | .... |

**Privileged subscriptions.** The term "privileged subscriptions" is a generic one covering all forms of offers to present stockholders or bondholders for new or treasury securities which the board of directors may propose to sell to them. These offers may consist of stocks or bonds of the same type or class now held by the investors in the corporation, or they may be of a different type or class. A common stockholder may, for example, be offered some preferred stock, or all the stockholders may be invited to subscribe to stock held by their corporation in another corporation. There are also several other possibilities.[57]

Privileged subscriptions have as their purpose the protection of stockholders against the dilution (1) of their existing interest in corporate earnings and assets, and (2) of their proportionate voting power.

[52] G.C.M. 13275, XIII-2 C.B. 121; *T. H. Hare Powel*, 27 B.T.A. 55.
[53] G.C.M. 13414, XIII-2 C.B. 124.
[54] (1948) Newlove 207.
[55] I.T. 2569, X-1 C.B. 101.
[56] (1938) Taylor-Miller 431–435; (1939) Kohler 157–159.
[57] See Dolley, J. C., *Principles of Investment* (New York: Harper and Bros., 1940), pp. 213–220.

From the standpoint of the corporation, no entries are required at the time of the offer of the privileged subscription. Any balance sheet prepared between the date of offer and the date of exercising the subscription (by the stockholders) should refer, however, to the fact that the stockholders have been offered the right to subscribe.[58]

When the privileged subscriptions are exercised, the corporation prepares the same type of entries as would be made if the securities were not first offered to stockholders. There is no transfer of amounts from earned surplus or any other type of surplus.[59]

Looking at the matter from the viewpoint of the security holder, the rights to subscribe for various classes of stock and bonds may or may not result in taxable income, depending upon whether the investor has obtained an interest in the corporation different from that which he previously owned.[60]

**Stock rights.** *Nature.*[61] While the term "stock rights" is frequently used as synonymous with the term "privileged subscription" (discussed above), stock rights are technically a special class of privileged subscription. The legal basis for stock rights rests on the theory that the power to issue stock is at all times subject to the equitable limitation that such issue must be so accomplished as to protect the ratable interest of existing and prospective shareholders. This principle of equity is based on the assumption that every shareholder has an interest in the payment made by every other shareholder upon the issuance of new stock. In order to carry this out, many jurisdictions provide that the present stockholders of a corporation shall have a pre-emptive right to subscribe to additional stock in the corporation when it is issued. Some states, however, allow this pre-emptive right to be waived under certain circumstances,[62] such as explicit provision in the charter or bylaws. The possible legal limitations upon the pre-emptive right may be summarized as follows:

1. The shares to be issued may be required to constitute an increase in the number of shares authorized in the charter.
2. The shares to be issued may be required to be issued for money rather than property which is to become part of the corporate assets.
3. The charter must contain no insertion waiving the right.
4. Some courts hold that the pre-emptive right does not attach to stock issued to effect a consolidation.[63]

[58] (1943) Paton 1003.
[59] (1943) Paton 1004.
[60] The Treasury Department rulings and court decisions on this matter are very numerous and cannot all be considered here. For a thorough discussion see Magill, R., *Taxable Income*, Revised (New York: Ronald Press Co., 1945), pp. 21–81.
[61] For the legal aspects of stock rights see Briggs, 7 *Accounting Review* 122; Briggs, 15 *Certified Public Accountant* 213.
[62] Drinker, 43 *Harvard Law Review* 586.
[63] *Archer v. Hesse*, 150 N.Y. 296.

While present stockholders may not have a legal pre-emptive right in many instances, the board of directors as a matter of policy may first offer additional shares to stockholders. In fact, this is often done to foster shareholder goodwill.

*Definition.* The term "stock right" has two possible interpretations. These are referred to as the "Boston" and the "Philadelphia" definitions. The Boston right refers to the subscription privilege pertaining to one share of old stock, while the Philadelphia right covers the subscription privilege necessary to secure one share of new stock. That is, a holder of ten shares of stock, who receives the right to subscribe for five new shares, owns ten rights according to the Boston definition and five rights according to the Philadelphia definition. This text uses the Boston interpretation, as it is the one used by most of the stock exchanges, and it is also used in the stock right parity formula (see discussion below).

*Dates.* The announcement by a corporation of an issue of stock rights (evidenced by documents called "warrants"), besides naming who may subscribe, the ratio of old shares to new (such as one new share for five now held), the subscription price, and the terms of payment, gives three important dates:

1. Announcement date
2. Date when stock ledger is closed for issuance of warrants
3. Termination of subscription privilege date

Between the announcement date and the warrant issue date, the stock rights are sometimes bought and sold on a stock exchange, "w.i." — when, as, and if issued — and the old stock is sold "rights-on" or "with rights." The stocks go "ex-rights" on the issuance of the warrants and the stock is sold ex-rights and the rights are sold ex-stock during the life of the warrants.

*Parity value.* The parity value is the theoretical sales price of the stock right. The parity value ($P$) depends on the subscription price of one new share ($S$), the number of old shares needed to have the right to subscribe for one new share ($N$), and either the market price of one old share rights-on ($M$) or the market price of one old share ex-rights ($M'$). The formulas concerning the parity value of stock rights are:

$$1.\ P = \frac{M - S}{N + 1}$$

$$2.\ M' = M - P$$

$$3.\ P = \frac{M' - S}{N}$$

If, for example, the holder of four shares has the right to subscribe for one new share for $85, when the old shares are selling rights-on at $110, the parity value according to the first formula would be:

$$P = \frac{\$110 - \$85}{4 + 1} = \$5$$

The ex-rights sales price for the old stock according to the second formula would be:

$$M' = \$110 - \$5 = \$105$$

And the parity value according to the third formula would be:

$$P = \frac{\$105 - \$85}{4} = \$5$$

Under practical market conditions, according to a study made by one authority, the actual market prices of stock rights tend to be slightly less than the parity value of the rights.[64]

*Investor's entries for stock rights.* When the U. S. Supreme Court [65] first ruled that the receipts from the sale of all stock rights were not taxable income, the Treasury Department prescribed a method for determining the taxable income arising from the sale of stock rights which is now interesting only from an historical point of view.[66] Effective January 1, 1925, the Treasury Department prescribed the use of the relative sales value theory in allocating the cost of the original investment to the stock and to the rights.[67] The passage of the Revenue Act of 1939 terminated the taxpayer's option of (1) allocating the cost of the old shares or (2) of including the receipts from the sales of stock rights in taxable income. The date, as of which the cost of the original investment must be allocated between the old shares and the stock rights issued in respect to such stock, is the date the rights accrue to the stockholders of record.[68] When the aggregate value of the old stock rights-on as of the date of record is known, and the values of the stock, ex-rights, and of the rights, ex-stock, are unknown, the fair market value of the rights may be assumed to be their parity value.[69] The equation to be used by an investor upon the receipt of stock rights is:

$$\frac{\text{Cost to be allocated to rights}}{\text{Cost of original investment}} = \frac{\text{Market price of rights}}{\text{Market price of stock and rights}}$$

[64] Dolley, 7 *Journal of Business of University of Chicago* 133.
[65] *Miles v. Safe Deposit and Trust Co. of Baltimore*, 259 U.S. 247.
[66] Regulations 65, Article 39.
[67] Regulations 69, Article 39.
[68] G.C.M. 1394, VI-1 C.B. 35; I.T. 2474, VIII-1 C.B. 65.
[69] I.T. 2509, VIII-2 C.B. 78.

The cost to be allocated to the rights as computed by using this equation should be debited to the Stock Rights account and credited to the Investment in Company X Stock account.

The accounting for stock rights is based largely upon the accounting for multiple purchases of stock. If shares of stock in a corporation are sold from lots purchased at different dates or at different prices and the identity of the lots cannot be determined, the stock sold should be charged against the earliest purchase of such stock.[70] However, the first-in, first-out rule applies only where there is neither identification by a certificate nor by designation of the taxpayer.[71] The question of sufficiency of identification shades off into very close court decisions which are outside the scope of this text.[72] If stock rights issued in respect of several different lots of stock are exercised at the same time, any sale of stock acquired through such exercise should be presumed to have been made from stock acquired through rights issued in respect of the earliest acquired lot, and if the latter lot was also acquired through rights exercised at the same time as rights in other lots were exercised, then the same principle should be carried back as many "generations" as are necessary in order to discover which lot should be presumed to have been sold.[73]

### *Illustrative Problem*

A taxpayer who held 432 shares of the common stock of Company M on January 1, 1945, received and exercised stock rights on June 8, 1946, June 1, 1948, and May 23, 1950, each issue of rights giving the privilege to subscribe to one new share for each six old shares. All the shares from the May 23, 1950, rights were represented by one certificate, No. P—.

Question No. 1: How many lots of stock did the taxpayer own and what was the order of acquisition in relation to the application of the first-in, first-out rule?

Question No. 2: If 85 shares out of the shares represented by certificate No. P— were sold, what shares were sold? If 60 shares were sold?

Question No. 3: If 100 shares were sold and the taxpayer specifies the shares represented by certificate No. P— with the remaining shares to be taken from another certificate representing all the other shares owned, what shares are sold?

### *Solution*

As to Question No. 1, the taxpayer owned eight lots of stock, dates of acquisition falling in numerical order as follows:

[70] Regulations 101, Article 22(a)–8; *Helvering v. Rankin Ex'r.*, 295 U.S. 123; *Snyder v. Commissioner*, 295 U.S. 134.

[71] *Miller v. Commissioner*, 80 Fed. (2nd) 219.

[72] See *James W. Arrott, Jr.*, 34 B.T.A. 133; *Bancitaly Corporation*, 34 B.T.A. 494; *James E. Davidson*, 34 B.T.A. 555; *Robert E. Ford*, 33 B.T.A. 1229; *Robert W. Brigham*, 27 B.T.A. 186; *James Cunningham*, 29 B.T.A. 717; *Howbert v. Penrose*, 38 Fed. (2nd) 577; *Milliken v. Commissioner*, 83 Fed. (2nd) 213; *Vawter v. Commissioner*, 83 Fed. (2nd) 11.

[73] G.C.M. 11743, XII–2 C.B. 31.

| | Lot 1 | Lot 2 | Lot 3 | Lot 4 | Lot 5 | Lot 6 | Lot 7 | Lot 8 |
|---|---|---|---|---|---|---|---|---|
| 1/1/45 holdings . . | 432 | | | | | | | |
| 6/8/46 rights: | | | | | | | | |
| On Lot 1 . . . . | | 72 | | | | | | |
| 6/1/48 rights: | | | | | | | | |
| On Lot 1 . . . . | | | 72 | | | | | |
| On Lot 2 . . . . | | | | 12 | | | | |
| 5/23/50 rights: | | | | | | | | |
| On Lot 1 . . . . | | | | | 72 | | | |
| On Lot 2 . . . . | | | | | | 12 | | |
| On Lot 3 . . . . | | | | | | | 12 | |
| On Lot 4 . . . . | | | | | | | | 2 |

As to Question No. 2, the 85 shares would be sold as follows: 72 out of Lot 5, 12 out of Lot 6, and one out of Lot 7. The 60 shares would be sold out of Lot 5.

As to Question No. 3, the 100 shares would be sold as follows: 98 shares out of certificate P— and two shares out of Lot 1.

The choice of method of realizing on rights is somewhat complicated by the resulting effect upon taxable income. The following problem shows that the three methods of disposing of the rights give three different taxable incomes even though the net cash outlay is the same in all three cases.

### *Illustrative Problem*

An individual investor bought 100 shares of a certain stock at $132 per share and then received the right to subscribe for 20 new shares at $105. The stock rights had July 2 as the date of record and August 20 as the expiration date. The following prices were established on the exchanges in New York City:

| | July 1 | July 2 | Aug. 20 | Sept. 21 |
|---|---|---|---|---|
| Market price of one share, ex-rights . . . . . | ..... | $120.00 | ..... | $121.00 |
| Market price of one share, with rights . . . . | $122.00 | 123.00 | ..... | ..... |
| Market price of one right separated from stock . | 3.20 | 3.00 | $2.76 | ..... |

What is the effect on the investor's taxable income if:

Case A: The investor sold his rights, "w.i.," on the stock exchange on July 1.

Case B: The investor exercised his rights on August 20 and sold 20 of the old shares on September 21.

Case C: The investor sold his stock with rights on July 1, and bought and exercised enough rights to replace his investment on August 20.

### *Solution*

It should be noted that in all three cases the investor had a net cash outlay of $12,880, i.e.,

Case A: $(100 \times \$132) - (100 \times \$3.20) = \$12,880$

Case B: $(100 \times \$132) + (20 \times \$105) - (20 \times \$121) = \$12,880$

Case C: $(100 \times \$132) - (100 \times \$122) + (500 \times \$2.76) + (100 \times \$105) = \$12,880$

CASE A

$$\frac{CR}{\$13,200} = \frac{\$300}{\$12,300}$$

$$CR = \$321.95$$

$$\$321.95 - \$320 = \$1.95, \text{ taxable deduction}$$

(The prices on July 2 are used since the stockholder is not entitled to receive the rights if he does not hold the stock on that date.)

CASE B

Cost allocated to rights was $321.95 (see Case A).

($13,200 − $321.95) × 20/100 = $2,575.61, cost of old shares sold

$2,575.61 − $2,420 = $155.61, taxable deduction

CASE C

100 × ($132 − $122) = $1,000, taxable deduction

**Stock purchase warrants.** A stock purchase warrant is an option to purchase shares of stock of a corporation at a fixed price. The offering price may vary during the years the warrant is in existence; however, some warrants are perpetual.

The warrant plan was originated by investment bankers in order to make the sale of preferred stock or fixed obligations of the company more attractive. Warrants are sold, therefore, in order to inject the possibility of speculative profit into the situation.

A stock purchase warrant has two distinct values:

1. A sale value, which exists from the time of the issuance of the warrants, if there are persons inclined to buy them.
2. An exercisable value, which comes into existence only when the market price of the optioned stock reaches or exceeds the option price.

The principal methods or circumstances under which warrants are issued are as follows:

1. The warrant is issued as a separate document, in order that it may be negotiated and used without regard to the certificate of preferred stock or bond. It is generally made payable to bearer and the option represented thereby can be exercised by the holder.
2. The warrant is attached to the certificate. The option can therefore be exercised only by the holder of the preferred stock or bond certificate.
3. The warrant is attached to the certificate of preferred stock or bond for a named period of time, after which it can be detached and negotiated separately.

The issue of stock purchase warrants is subject to the pre-emptive right to purchase the new shares (if the stock to be subscribed for enjoys the right)

except where by charter or bylaw provisions the stockholders have given their consent to the sale of the option-bearing securities to others.[74]

Stock warrants have been sold as follows:[75]

1. No-par value common stock warrants sold with bonds
2. Par value common stock warrants sold with bonds
3. No-par value common stock warrants sold with par value preferred stock
4. No-par value common stock warrants sold with no-par value preferred stock
5. No-par value common stock warrants sold with no-par value common stock

The U. S. Internal Revenue Bureau meets the difficult problem of allocating the cost of the original investment between the principal securities and the warrants by allowing the values as of date of purchase to be determined from all available evidence.[76]

### *Illustrative Problem*

On July 1, S bought at $995 each, five bonds, each of which carried a detachable stock warrant giving the holder the option to buy ten shares of common stock at $25 per share. Within the option period, S sold the warrants from two bonds for $100 and one of the bonds (warrant detached) for $997. Give S's entries assuming that he exercised the option contained in the other warrants and that the evidence showed that the fair July 1 allocations of cost were: Bond, ex-warrant, $960, and warrant, detached, $35.

**Journal Entries**

| | | |
|---|---|---|
| Bond Investment ($995 × 5) | $4,975 | |
| Cash | | $4,975 |
| To record the investment; allocation of cost need not be made unless warrants are sold or exercised. | | |
| Stock Warrants ($35 × 5) | 175 | |
| Bond Investment | | 175 |
| To allocate the cost. | | |
| Cash | 100 | |
| Stock Warrants ($35 × 2) | | 70 |
| Profit and Loss on Warrants | | 30 |
| To record sale of warrants, ex-bonds. | | |
| Cash | 997 | |
| Bond Investment ($995 − $35) | | 960 |
| Profit and Loss on Bonds | | 37 |
| To record sale of bond, ex-warrant. | | |
| Stock Investment | 855 | |
| Stock Warrants ($35 × 3) | | 105 |
| Cash ($25 × 10 × 3) | | 750 |
| To record the exercise of the warrants. | | |

[74] (1937) Montgomery 553.
[75] For illustrations see Newlove, 4 *Accounting Review* 253.
[76] G.C.M. 7420, IX-1 C.B. 80.

**Blocks of securities combined by reorganization.** When securities are acquired in several blocks or units (or otherwise acquired) the tax basis for each purchase must be kept separate in order that subsequent sales (or dispositions) may be written off the taxpayer's books at a valuation determined by either (a) the first-in, first-out rule or (b) the specific-item-sold rule. However, if a single stock or bond certificate is issued in a statutory reorganization for several lots of stock purchased at varying dates and prices, the lots lose their identity and all the new stock is assumed to have been acquired at one time for the aggregate bases of the old lots of securities.[77]

**Adjustments to original tax basis.** *Increases.* In many instances the problem of what constitutes an addition to the original tax basis is similar in nature to the familiar accounting problem of distinguishing between "capital and revenue expenditures." In the main, if an item of expenditure may be added to an asset in the accounts by following accepted accounting standards, the same item may usually be added to the tax basis of the asset in question. A voluntary prorata assessment on all stockholders may be added to the tax basis,[78] although, if a stockholder gratuitously forgives a debt the corporation owes him, such a contribution has been ruled to be a gift.[79]

*Decreases.* As the book value and the tax basis of a stock investment normally are the same amount, the decreases in tax basis of old stock investments caused by the issuance of nontaxable stock rights and nontaxable stock warrants are made according to procedures which use the relative sales values of the old stock and the new rights or warrants. Cash and property dividends declared by operating corporations out of contributed surplus,[80] the Reserve for Depletion account,[81] and earned surplus accumulated prior to March 1, 1913,[82] cause a decrease in the tax basis of the stock upon which they are declared. Nontaxable stock dividends reduce the tax basis per share but not the total tax basis if payable in precisely the same class of stock; if payable in shares not precisely of the same class, the tax basis of the old shares is reduced by the amount thereof allocated to the new stock by the application of the relative sales value rule. Distributions out of unrealized appreciation or out of depreciation or depletion reserves reduce the tax basis of the stock and are taxable only when the tax basis has been exceeded.[83]

**Securities acquired prior to March 1, 1913.**[84] The tax basis for securities

[77] *Commissioner v. Von Gunten et al.*, 76 Fed. (2nd) 670.
[78] Regulations 111, Section 29.22(a)–17.
[79] Regulations 111, Section 29.22(a)–14.
[80] *Weaver v. Commissioner*, 58 Fed. (2nd) 755.
[81] Regulations 111, Section 29.115–6.
[82] Regulations 111, Section 29.115–2.
[83] A. W. Gregg Explanation of Section 115(d) in the Treasury Draft of 1924 Act.
[84] Regulations 111, Section 29.113(a)(14)–1.

acquired before March 1, 1913, when the first modern income tax law went into effect, is the greater of (1) the adjusted cost value, or (2) the adjusted March 1, 1913, fair market value for the determination of a gain; the adjusted cost is used for the determination of a loss. If the cost figure is used, it must be adjusted for the period from date of purchase to date of transfer. If the March 1, 1913, value is used, it must be adjusted for the period from March 1, 1913, to date of transfer; such adjustments are computed on the March 1, 1913, value.

**Bonds purchased with interest in default.** Some bonds are bought and sold even though the interest is not currently being paid; in other situations there may be some past-due interest which has not been paid by the issuing party at the date the investor acquires the security. It is commonplace to refer to the purchase of the bonds in these instances as being acquired "flat." For example, suppose $100,000 par of bonds (on which interest is in default amounting to $24,000) are purchased at a flat price of $60,000. A year or two later $10,000 is received on account of the interest in arrears; the accepted accounting standard calls for this amount to be treated as a return of a portion of the principal rather than as realized revenue. This view is also followed for tax purposes.[85]

**Bonds acquired by issuing corporation for sinking fund.** When a corporation originally sells bonds at a figure above or below par, the amount of the premium (or discount) is recorded in a separate account and thus does not give rise to a revenue or an expense as of the issue date. Subsequently, as the interest on the bonds is paid the premium or discount is amortized (the mathematical techniques for doing this are illustrated in a later section of this chapter). Suppose, however, that the bonds are reacquired by the corporation prior to their maturity. The Income Tax Regulations provide that this acquisition gives rise to a taxable gain to the corporation if the purchase price is less than the carrying value (original issue price plus or minus the premium or discount) of the bonds on the books of the corporation. On the other hand, a loss may be reported if the purchase price is more than the carrying value.[86] If the purchase price of the bonds is considerably below par, it has been suggested that it be considered as an event which should give rise to a revaluation of the corporate assets.[87] This suggestion has not proved very popular even though it has been permitted for some years as an alternate method for taxing the income of railroads.

**Accommodation paper (notes and acceptances).** Some business firms make a practice of lending their names (and credit reputation) to other

[85] I.T. 1337, I-1 C.B. 29.
[86] Regulations 111, Section 29.22(a)–17.
[87] (1945) Leland, Ch. 9, p. 6.

parties as a maker, drawer, acceptor, or endorser of a negotiable instrument. This lending of a name is usually done in order to allow the accommodated party an opportunity to borrow some money or to buy some property which the accommodated party could not otherwise acquire. Occasionally, however, the accommodation party will sign the instrument in order to allow the accommodated party to obtain the funds at a lower rate of interest or on more favorable terms. There are two procedures employed in carrying out the accommodation. Each of these is described below.

*Procedure where accommodation party is maker of instrument.* Where this procedure is followed the accommodated party usually takes the document with him when he visits the lender of the money or the seller of the property. The accommodation party thus has a direct and primary liability on the obligation. He would record this liability (including interest) as follows:

| | | |
|---|---|---|
| Accommodated Party (ABC) | $2,080 | |
| Accommodation Notes Payable | | $2,080 |
| To record issuance of $2,000 note for accommodation of ABC due in 1 year at 4 per cent interest. | | |

When the debt comes due, the accommodation party, being primarily liable, would record his payment as follows:

| | | |
|---|---|---|
| Accommodation Notes Payable | $2,080 | |
| Cash | | $2,080 |

When the accommodated party remits to the accommodation party, the following entry would be made:

| | | |
|---|---|---|
| Cash | $2,080 | |
| Accommodated Party (ABC) | | $2,080 |

If the accommodated party does not repay the accommodation party, the latter would be forced to write off the asset account to a Loss on Accommodation account which would in turn be closed to Profit and Loss account.

*Procedure where accommodation party is endorser or guarantor of instrument.* Where this procedure is followed the accommodated party usually signs the obligation as one being primarily liable and the accommodation party simply guarantees payment. Many accountants recommend that this situation should be described (as a contingent liability) in a footnote to the balance sheet prepared by the accommodation party. Other persons suggest that the following entry is called for:

| | | |
|---|---|---|
| Accommodated Party (ABC) | $2,080 | |
| Contingent Liability on Accommodation Endorsement | | $2,080 |
| To record contingent liability on $2,000 note for accommodation of ABC due in 1 year at 4 per cent interest. | | |

The entry just suggested would be reversed when the obligation matures and is paid off in full by the accommodated party. In the event that the latter does not pay, the accommodation party would debit the Contingent Liability account and credit Cash. Finally, after some time has passed by it may be necessary (because of the inability to collect from the accommodated party) to write off the Accommodated Party (ABC) account to a Loss on Accommodation account.

**Notes purchased on a discount basis.** In some types of businesses it is customary to make loans on a discount basis, the firm receiving as evidence a single or a group of promissory notes. The notes may or may not bear additional interest based on their face amount or on the amount outstanding from period to period. Several accounting problems arise from transactions of this type, the most important being the determination of the proper amount of discount reportable as being realized each period (or, in the alternative, how much discount is earned on each of the several installments collected). The typical contract of the variety under discussion calls for the periodic repayment of a cash loan of, say, $500 in ten equal installments of $60 each, making $600 the face of the obligation. As mentioned above, the discount of $100 in this case may or may not be supplemented by additional interest. However, from the standpoint of practice the simple type of loan just stated may be elaborated upon in any of the following ways [88] (a discount is assumed to be present in each of these situations):

a. Notes collectible in full at maturity, with interest collectible periodically over the term of the debt
b. Notes collectible in fixed installments of the same sum, with no interest
c. Notes collectible in fixed installments of irregular sums, with no interest
d. Notes collectible in fixed installments of the same sum, with interest at a fixed per cent on the outstanding balances
e. Notes collectible in fixed installments of irregular sums, with interest at a fixed per cent on the outstanding balances
f. Notes collectible in fixed installments of the same sum, with interest at a fixed per cent on the nominal principal of the obligations
g. Notes collectible in part in regular periodical installments of the same sum, including interest, and the remainder of the loan collectible in one sum at the end of the term of the loan

*Discussion of type* (*a*). In this type of loan the interest would be realized gradually over the term of the loan. The discount, however, to be accurate, should be considered as having been earned periodically as well as being added to the actual loan; since this would cause the Loan Receivable

[88] This outline and the tables given on later pages of this section are based by permission on an excellent summary given in Wilde, 41 *Journal of Accountancy* 106–117 (three of the methods illustrated by Mr. Wilde, but not recommended by him are omitted here).

account to increase during the life of the obligation, the amount of discount reported as being realized each period would increase proportionately. It is common practice, though, to set up the discount at the time of the loan as a deferred credit and to charge the deferred credit periodically with an aliquot part of the discount. Thus, the aliquot part would be reported as being realized each period. This last treatment is generally considered satisfactory.

*Discussion of type* (*b*). The discount realized in each period may be determined in two ways when the notes are collectible in fixed installments of the same sum. Suppose a loan of $1,500 is made, subject to a discount of $150, collectible in five installments of $300 each.

TABLE I

Based upon the time for which one unit or its equivalent is outstanding

| | | Discount earned | | | | |
|---|---|---|---|---|---|---|
| Period | Balance of nominal principal | Basis | Percentage of total | Amount | Amortization of loan | Balance of actual loan |
| 0 . . . | ..... | ..... | ..... | ..... | ..... | $1,350.00 |
| 1 . . . | $1,500.00 | 5/15 | 33.33 | $ 50.00 | $ 250.00 | 1,100.00 |
| 2 . . . | 1,200.00 | 4/15 | 26.67 | 40.00 | 260.00 | 840.00 |
| 3 . . . | 900.00 | 3/15 | 20.00 | 30.00 | 270.00 | 570.00 |
| 4 . . . | 600.00 | 2/15 | 13.33 | 20.00 | 280.00 | 290.00 |
| 5 . . . | 300.00 | 1/15 | 6.67 | 10.00 | 290.00 | ..... |
| | $4,500.00 | 15/15 | 100.00 | $150.00 | $1,350.00 | ..... |

TABLE II

Based on the effective interest rate (3.618%[a] per period)

| | | Discount | | | |
|---|---|---|---|---|---|
| Period | Payments | Percentage of total | Amount[b] | Amortization of loan | Balance of actual loan |
| 0 . . . . . | ..... | ..... | ..... | ..... | $1,350.00 |
| 1 . . . . . | $ 300.00 | 32.56 | $ 48.84 | $ 251.16 | 1,098.84 |
| 2 . . . . . | 300.00 | 26.51 | 39.76 | 260.24 | 838.60 |
| 3 . . . . . | 300.00 | 20.23 | 30.34 | 269.66 | 568.94 |
| 4 . . . . . | 300.00 | 13.72 | 20.58 | 279.42 | 289.52 |
| 5 . . . . . | 300.00 | 6.98 | 10.48 | 289.52 | ..... |
| | $1,500.00 | 100.00 | $150.00 | $1,350.00 | ..... |

*a*. See pages 211–212 for technique of determining this per cent.
*b*. 3.618% × $1,350 = $48.84; 3.618% × $1,098.84 = $39.76, etc.

While Table II illustrates the more exact method, Table I meets the requirements of approximate accuracy; there is only a few cents difference in the amount of discount amortized each period. There is an even smaller difference in the results when the number of periods involved is larger, i.e., a longer term loan or sale.

*Discussion of type* (*c*). There are alternative methods which may be employed when the notes are collectible in fixed installments of irregular sums. Suppose a loan or sale of $5,095.74 is made, discounted at $416.85, repayable in 12 periods.

TABLE III

Based upon the percentage of the balance of the nominal principal outstanding at the beginning of each period to the aggregate of such balances

| Period | Balance of nominal principal | Payments | Discount: Percentage of total | Discount: Amount | Amortization of loan | Balance of actual loan | Per cent earned |
|---|---|---|---|---|---|---|---|
| 0 | ..... | ..... | ..... | ..... | ..... | $4,678.89 | 1.7261 |
| 1 | $ 5,095.74 | $ 606.00 | 19.375 | $ 80.76 | $ 525.24 | 4,153.65 | 1.7132 |
| 2 | 4,489.74 | 606.00 | 17.071 | 71.16 | 534.84 | 3,618.81 | 1.7011 |
| 3 | 3,883.74 | 595.34 | 14.767 | 61.56 | 533.78 | 3,085.03 | 1.6894 |
| 4 | 3,288.40 | 551.60 | 12.503 | 52.12 | 499.48 | 2,585.55 | 1.6778 |
| 5 | 2,736.80 | 518.35 | 10.406 | 43.38 | 474.97 | 2,110.58 | 1.6659 |
| 6 | 2,218.45 | 483.67 | 8.435 | 35.16 | 448.51 | 1,662.07 | 1.6546 |
| 7 | 1,734.78 | 436.92 | 6.596 | 27.50 | 409.42 | 1,252.65 | 1.6421 |
| 8 | 1,297.86 | 414.44 | 4.935 | 20.57 | 393.87 | 858.78 | 1.6302 |
| 9 | 883.42 | 401.07 | 3.359 | 14.00 | 387.07 | 471.71 | 1.6196 |
| 10 | 482.35 | 304.18 | 1.834 | 7.64 | 296.54 | 175.17 | 1.6156 |
| 11 | 178.17 | 167.42 | .678 | 2.83 | 164.59 | 10.58 | 1.6068 |
| 12 | 10.75 | 10.75 | .041 | .17 | 10.58 | ..... | ..... |
| | $26,300.20 | $5,095.74 | 100.000 | $416.85 | $4,678.89 | ..... | ..... |

TABLE IV

Based upon the effective interest rate (1.6915%[a] per period)

| Period | Payments | Discount: Percentage of total | Discount: Amount[b] | Amortization of loan | Balance of actual loan |
|---|---|---|---|---|---|
| 0 | ..... | ..... | ..... | ..... | $4,678.89 |
| 1 | $ 606.00 | 18.985 | $ 79.14 | $ 526.86 | 4,152.03 |
| 2 | 606.00 | 16.848 | 70.23 | 535.77 | 3,616.26 |
| 3 | 595.34 | 14.674 | 61.17 | 534.17 | 3,082.09 |
| 4 | 551.60 | 12.506 | 52.13 | 499.47 | 2,582.62 |
| 5 | 518.35 | 10.479 | 43.68 | 474.67 | 2,107.95 |
| 6 | 483.67 | 8.555 | 35.66 | 448.01 | 1,659.94 |
| 7 | 436.92 | 6.736 | 28.08 | 408.84 | 1,251.10 |
| 8 | 414.44 | 5.076 | 21.16 | 393.28 | 857.82 |
| 9 | 401.07 | 3.481 | 14.51 | 386.56 | 471.26 |
| 10 | 304.18 | 1.912 | 7.97 | 296.21 | 175.05 |
| 11 | 167.42 | .710 | 2.96 | 164.46 | 10.59 |
| 12 | 10.75 | .038 | .16 | 10.59 | ..... |
| | $5,095.74 | 100.000 | $416.85 | $4,678.89 | ..... |

*a*. This per cent may be obtained by taking a weighted average of the amounts in the last column of Table III, adjusted slightly to meet the needs of the problem.

*b*. 1.6915% × $4,678.89 = $79.14, etc.

While Table IV illustrates the more exact method, Table III meets the requirements of approximate accuracy.

*Discussion of types* (*d*) *and* (*e*). So far as the determination of realized discount is concerned these two types of loans can be handled as shown in Tables I and III, respectively. Of course, the interest collected and earned periodically would also have to be recorded; this matter, however, should offer no accounting difficulty.

*Discussion of type* (*f*). This type of loan or sale offers more complications than any other variety. Suppose, for example, a loan of $4,000 is made, discounted at $400, collectible in 20 approximately equal six-months-apart installments including interest at the rate of eight per cent per year. By use of an annuity formula, the amount of approximately $294.33 is found to be the necessary sum required to repay the loan in the 20 periods. From Table V below the total amount paid by the person who owes the money is determined to be $5,886.54; this figure includes interest and discount as well as the principal.

TABLE V

Showing balance of nominal principal after applying each periodical payment (interest computed at nominal rate on balance of nominal principal)

| Period | Payments | Interest | Amortization of nominal principal | Balance of nominal principal |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $4,000.00 |
| 1 | $ 294.33 | $ 160.00 | $ 134.33 | 3,865.67 |
| 2 | 294.33 | 154.63 | 139.70 | 3,725.97 |
| 3 | 294.32 | 149.04 | 145.28 | 3,580.69 |
| 4 | 294.33 | 143.23 | 151.10 | 3,429.59 |
| 5 | 294.33 | 137.18 | 157.15 | 3,272.44 |
| 6 | 294.32 | 130.90 | 163.42 | 3,109.02 |
| 7 | 294.33 | 124.36 | 169.97 | 2,939.05 |
| 8 | 294.33 | 117.56 | 176.77 | 2,762.28 |
| 9 | 294.32 | 110.49 | 183.83 | 2,578.45 |
| 10 | 294.33 | 103.14 | 191.19 | 2,387.26 |
| 11 | 294.33 | 95.49 | 198.84 | 2,188.42 |
| 12 | 294.32 | 87.54 | 206.78 | 1,981.64 |
| 13 | 294.33 | 79.27 | 215.06 | 1,766.58 |
| 14 | 294.33 | 70.66 | 223.67 | 1,542.91 |
| 15 | 294.32 | 61.72 | 232.60 | 1,310.31 |
| 16 | 294.33 | 52.41 | 241.92 | 1,068.39 |
| 17 | 294.33 | 42.73 | 251.60 | 816.79 |
| 18 | 294.32 | 32.67 | 261.65 | 555.14 |
| 19 | 294.33 | 22.20 | 272.13 | 283.01 |
| 20 | 294.33 | 11.32 | 283.01 | ..... |
| | $5,886.54 | $1,886.54 | $4,000.00 | ..... |

Table VI below shows how much interest may be considered earned each period under the actuarial method. This is, of course, the most accurate technique.

TABLE VI

Showing result by actuarial method (effective rate 5.22163% [a] per period)

| Period | Payments | Interest [b] | Amortization of loan | Balance of loan |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $3,600.00 |
| 1 | $ 294.33 | $ 187.98 | $ 106.35 | 3,493.65 |
| 2 | 294.33 | 182.43 | 111.90 | 3,381.75 |
| 3 | 294.32 | 176.58 | 117.74 | 3,264.01 |
| 4 | 294.33 | 170.43 | 123.90 | 3,140.11 |
| 5 | 294.33 | 163.96 | 130.37 | 3,009.74 |
| 6 | 294.32 | 157.16 | 137.16 | 2,872.58 |
| 7 | 294.33 | 149.99 | 144.34 | 2,728.24 |
| 8 | 294.33 | 142.46 | 151.87 | 2,576.37 |
| 9 | 294.32 | 134.53 | 159.79 | 2,416.58 |
| 10 | 294.33 | 126.18 | 168.15 | 2,248.43 |
| 11 | 294.33 | 117.40 | 176.93 | 2,071.50 |
| 12 | 294.32 | 108.17 | 186.15 | 1,885.35 |
| 13 | 294.33 | 98.45 | 195.88 | 1,689.47 |
| 14 | 294.33 | 88.22 | 206.11 | 1,483.36 |
| 15 | 294.32 | 77.46 | 216.86 | 1,266.50 |
| 16 | 294.33 | 66.13 | 228.20 | 1,038.30 |
| 17 | 294.33 | 54.22 | 240.11 | 798.19 |
| 18 | 294.32 | 41.68 | 252.64 | 545.55 |
| 19 | 294.33 | 28.49 | 265.84 | 279.71 |
| 20 | 294.33 | 14.62 | 279.71 | ..... |
| | $5,886.54 | $2,286.54 | $3,600.00 | ..... |

a. See pages 211–212 for technique of determining this per cent.
b. 5.22163% × $3,600 = $187.98, etc.

If only reasonable accuracy is desired, the method followed in Table III may be associated with the last column of Table V. This alternative, however, calls for the preparation of a new table for each size of loan or sale; this added complication may be avoided by using the method suggested in Table I.

*Discussion of type* (*g*). The technique which will give reasonably accurate results in this type of loan or sale calls for the separation of the obligation into two parts: (1) the sum which is supposed to be collected in installments and (2) the remainder which is due all at one time. After this division has been accomplished, the discount on the obligation is prorated between the two parts in proportion to their size in dollars. The same treatment is then applied to the remainder sum as is given to type (a) loans, while the installments may be handled as shown in Tables I or III.

**Valuation of noncurrent asset investments.** Many business firms own securities which have been issued by other organizations or institutions. The ownership may not be substantial enough, however, to prepare consolidated statements; and even though these investments are sometimes highly liquid (readily sold), there is no intention of disposing of them (thus they are not classifiable as current assets). Investments of this type are usually separately listed as a group on the balance sheet between the current and fixed asset classifications. In some instances the dollar amount involved in this item will run into millions. Investments of this type are made for a variety of reasons, the more important being (1) securing a source of raw material, (2) securing a market for products sold, (3) trying to obtain corporate economic security, and (4) investing funds for income and price appreciation.

The specific titles used on the balance sheet for this item vary a great deal and some firms use more than one subclassification. A recent sample survey [89] showed the following:

| Titles Used | Number of Companies |
|---|---|
| Group A. Investments in Subsidiaries and Affiliates not Consolidated. . . | 77 |
| Group B. Other Investments. . . . . | 96 |
| Listed as: | |
| Other Assets . . . . . | 26 |
| Miscellaneous . . . . . | 19 |
| Other Investments . . . . . | 18 |
| Sundry . . . . . | 13 |
| Securities . . . . . | 12 |
| Marketable Securities — Not Current . . . . . | 7 |
| Investments and Real Estate. . . . . | 1 |
| | 96 |

The valuation bases used for this item also vary a great deal. The valuation bases used by the 77 firms mentioned above (Group A) and the 96 firms (Group B) are shown in the table on page 266. While the lower-of-cost-or-market rule is very commonly employed,[90] it was used by only a few firms in the survey. However, the numerous ones which deducted reserves (or made other adjustments) may have tried to accomplish roughly the same results. No specific evidence is given as to whether the rule of cost or market, whichever is lower, is applied to the composite group of investments or to each item separately. All of these plans have their supporters, but the present writers favor the cost basis with the proviso that the management may desire to set up an appropriated earned surplus reserve to report on the balance sheet significant price

[89] Kircher, 25 *Accounting Review* 90 (statistics quoted by permission).
[90] (1946) Kester 117.

| Valuation Bases | Number of Companies Group A | Group B |
|---|---|---|
| Cost | 25 | 16 |
| Cost, less reserves | 12 | 12 |
| Debiting share of subsidiary profit, described in various ways | 8 | |
| Less reserves | 7 | 14 |
| Foreign, at exchange rates | 5 | |
| Schedules, net, list, etc. | 5 | |
| Not more than share of subsidiary equity | 3 | |
| Not over cost | 3 | |
| Cost plus advances | 2 | |
| Cost less dividends | 1 | |
| Cost less adjustment at acquisition | 1 | |
| Market | 1 | |
| Market where quoted | 1 | |
| Value, plus cost of additions | 1 | |
| Cost or less | | 10 |
| Cost or market | | 1 |
| Par | | 1 |
| Less estimated loss | | 1 |
| Less than equity | | 1 |
| No basis shown | 10 | 40 |
| | 85* | 96 |

* Eight of these firms adopted more than one basis for different investments.

declines. It is also desirable to indicate the current market price, where available, in a footnote or as a parenthetical expression on the balance sheet.

### Valuation of Bonds

**Bond tables.** While bonds are usually spoken of as though their interest coupons matured annually, it is understood in the business world that unless otherwise notified, bonds carry semiannual interest coupons. The following is an excerpt from Sprague's Extended Bond Tables:

***Values, to the nearest cent, of a bond of $1,000,000 at 5% interest, payable semiannually***

| Net Income | ½ Year | 1 Year | 1½ Years | 2 Years | 2½ Years | 3 Years |
|---|---|---|---|---|---|---|
| 2.50 | 1012345.68 | 1024538.94 | 1036581.67 | 1048475.72 | 1060222.94 | 1071825.12 |
| 2.55 | 1012095.78 | 1024039.28 | 1035832.41 | 1047477.08 | 1058975.15 | 1070328.46 |
| 2.60 | 1011846.00 | 1023539.98 | 1035083.89 | 1046479.66 | 1057729.18 | 1068834.33 |
| .... | ..... | ..... | ..... | ..... | ..... | ..... |
| 4.00 | 1004901.96 | 1009707.80 | 1014419.42 | 1019038.64 | 1023567.30 | 1028007.15 |
| .... | ..... | ..... | ..... | ..... | ..... | ..... |
| 6.00 | 995145.63 | 990432.65 | 985856.94 | 981414.51 | 977101.46 | 972914.04 |

In bond tables, both the coupon and yield rates are nominal annual rates.

**Ordinary semiannual bonds.** As semiannual bonds may be readily evaluated by using the Makeham formula, cases Nos. 1, 2, and 3 given on pages 229–230 to illustrate the use of the Makeham formula are combined below to show how these illustrative problems may be solved by the most famous of the special bond formulas.

Letting $M$ and $P$ represent the maturity (redemption) and par values, respectively, $c$ and $y$ the effective coupon and yield rates per bond interest payment period, respectively, and $n$ the number of bond interest payment periods, the most popular bond formulas are:

Formula No. 1 $$A = \frac{My - cP + cP(1+y)^n}{y(1+y)^n}$$

Formula No. 2 $$A = P - [P(y-c)a_{\overline{n}|y}] + [(M-P)(1+y)^{-n}]$$

Formula No. 3 $$A = M(1+y)^{-n} + [cP \times a_{\overline{n}|y}]$$

Formula No. 4 $$A = M + (cP - My)a_{\overline{n}|y}$$

Formula No. 2 is much more widely used than Formula No. 1 because of its mnemonic advantage; i.e., it is relatively easy to remember that the valuation of a bond is equal to the par value minus the discount caused by the shortage of interest plus the discounted value of the redemption premium. If bonds sell at a premium, Formula No. 2 calls for subtracting the negative value found in the second term; i.e., the premium is added to the par value. Formula No. 2 is so popular that a knowledge of it has sometimes been assumed on C.P.A. examinations. If the maturity and par values are equal, the third term of Formula No. 2 disappears. Formula No. 1 is especially useful in valuing bonds at unusual (untabulated) interest rates and in approximating yields of bonds to be retired at a premium. Formula No. 3 evaluates bonds to be redeemed at a premium very efficiently, but since it uses two interest tables instead of one, it is not as satisfactory for ascertaining the effective yields of bonds as is Formula No. 1 or No. 2 (when bonds are redeemed at par). Formula No. 4 is preferred by many writers on the mathematics of finance, since it is noted for its simplicity.

*Illustrative Problem*

Find the price of 100 bonds of Company W, dated June 30, 1950, par $1,000 each, 5 per cent, 3 years, interest December 31 and June 30, if:

| | Date of sale | Maturity value | Annual yield rate (converted semiannually) |
|---|---|---|---|
| Case No. 1 . . . . | June 30, 1950 | $1,000 | 6% |
| Case No. 2 . . . . | June 30, 1950 | 1,000 | 4% |
| Case No. 3 . . . . | June 30, 1950 | 1,020 | 6% |

*Annotated Solution*

CASE NO. 1

$$A = \frac{(\$100{,}000 \times .03) - (\$100{,}000 \times .025) + [\$100{,}000 \times .025 \times (1.03)^{6}]}{.03 \times (1.03)^{6}}$$

$= \$97{,}291.40$

$A = \$100{,}000 - [\$100{,}000 \times (.03 - .025) \times a_{\overline{6}|.03}] = \$97{,}291.40$

$A = [\$100{,}000 \times (1.03)^{-6}] + [\$100{,}000 \times .025 \times a_{\overline{6}|.03}] = \$97{,}291.40$

$A = \$100{,}000 + \{[(\$100{,}000 \times .025) - (\$100{,}000 \times .03)] \times a_{\overline{6}|.03}\}$

$= \$97{,}291.40$

CASE NO. 2

$$A = \frac{(\$100{,}000 \times .02) - (\$100{,}000 \times .025) + [\$100{,}000 \times .025 \times (1.02)^{6}]}{.02 \times (1.02)^{6}}$$

$= \$102{,}800.72$

$A = \$100{,}000 - [\$100{,}000 \times (.02 - .025) \times a_{\overline{6}|.02}] = \$102{,}800.72$

$A = [\$100{,}000 \times (1.02)^{-6}] + [\$100{,}000 \times .025 \times a_{\overline{6}|.02}] = \$102{,}800.72$

$A = \$100{,}000 + \{[(\$100{,}000 \times .025) - (\$100{,}000 \times .03)] \times a_{\overline{6}|.02}\}$

$= \$102{,}800.72$

CASE NO. 3

$$A = \frac{(\$102{,}000 \times .03) - (\$100{,}000 \times .025) + [\$100{,}000 \times .025 \times (1.03)^{6}]}{.03 \times (1.03)^{6}}$$

$= \$98{,}966.37$

$A = \$100{,}000 - [\$100{,}000 \times (.03 - .025) \times a_{\overline{6}|.03}] + [(\$102{,}000 - \$100{,}000) \times (1.03)^{-6}] = \$98{,}966.37$

$A = [\$102{,}000 \times (1.03)^{-6}] + [\$100{,}000 \times .025 \times a_{\overline{6}|.03}] = \$98{,}966.37$

$A = \$102{,}000 + \{[(\$100{,}000 \times .025) - (\$102{,}000 \times .03)] \times a_{\overline{6}|.03}\} = \$98{,}966.37$

**Proof of Accuracy and Issuer's Entries**

CASE NO. 1

| Date | Cash Cr. | Bond Interest Dr. | Bond Discount Cr. | Carrying Value |
|---|---|---|---|---|
| 6/30/50 | ..... | ..... | ..... | $ 97,291.40 |
| 12/31/50 | $2,500.00 | $2,918.74 | $418.74 | 97,710.14 |
| 6/30/51 | 2,500.00 | 2,931.30 | 431.30 | 98,141.44 |
| 12/31/51 | 2,500.00 | 2,944.24 | 444.24 | 98,585.68 |
| 6/30/52 | 2,500.00 | 2,957.57 | 457.57 | 99,043.25 |
| 12/31/52 | 2,500.00 | 2,971.30 | 471.30 | 99,514.55 |
| 6/30/53 | 2,500.00 | 2,985.45 | 485.45 | 100,000.00 |

CASE No. 2

| Date | Cash Cr. | Bond Interest Dr. | Bond Premium Dr. | Carrying Value |
|---|---|---|---|---|
| 6/30/50 | ..... | ..... | ..... | $102,800.72 |
| 12/31/50 | $2,500.00 | $2,056.01 | $443.99 | 102,356.73 |
| 6/30/51 | 2,500.00 | 2,047.13 | 452.87 | 101,903.86 |
| 12/31/51 | 2,500.00 | 2,038.08 | 461.92 | 101,441.94 |
| 6/30/52 | 2,500.00 | 2,028.84 | 471.16 | 100,970.78 |
| 12/31/52 | 2,500.00 | 2,019.42 | 480.58 | 100,490.20 |
| 6/30/53 | 2,500.00 | 2,009.80 | 490.20 | 100,000.00 |

CASE No. 3

| Date | Cash Cr. | Bond Interest Dr. | Bond Discount or Reserve for Redemption Premium Cr. | Carrying Value |
|---|---|---|---|---|
| 6/30/50 | ..... | ..... | ..... | $ 98,966.37 |
| 12/31/50 | $2,500.00 | $2,968.99 | $468.99 | 99,435.36 |
| 6/30/51 | 2,500.00 | 2,983.06 | 483.06 | 99,918.42 |
| 12/31/51 | 2,500.00 | 2,997.55 | 497.55 | 100,415.97 |
| 6/30/52 | 2,500.00 | 3,012.50 | 512.50 | 100,928.47 |
| 12/31/52 | 2,500.00 | 3,027.85 | 527.85 | 101,456.32 |
| 6/30/53 | 2,500.00 | 3,043.68 | 543.68 | 102,000.00 |

NOTES

1. In all cases, the Bond Interest Dr. figures are the product of the previous carrying value multiplied by $y$.

2. The discount and premium amortization figures are always the previous amortization figures multiplied by $(1 + y)$; this is really utilizing the $AD_t$ formula given on page 236.

3. The carrying values for bonds redeemable at par can be read from Sprague's Tables; i.e., the carrying values for Case No. 1 and Case No. 2 agree with the values shown on the six and four per cent yield lines respectively, in the excerpt from Sprague's Tables on page 266.

4. If the bond had been sold at a premium to be retired at a different premium, the technique would be the same as in Case No. 3, except that the Bond Discount column heading would be Bond Premium Dr. if the issuing premium was more than the redemption premium, and Bond Premium Cr. if the issuing premium was less than the redemption premium; in the first instance the amortization would be subtracted from the previous carrying value, and in the latter it would be added.

5. The form for the straight line bond amortization tables is the same as for the scientific tables. The periodic amortizations are, however, constant. In Case No. 1, the full period amortization is [1/6 × ($100,000 − $97,291.40)] or $451.43; in Case No. 2, [1/6 × ($102,800.72 − $100,000)] or $466.79; and in Case No. 3, [1/6 × ($102,000 − $98,966.37)] or $505.60.

6. The journal entry in Case C for the six months ending December 31, 1951, is:

| | | |
|---|---|---|
| Bond Interest Expense | $2,997.55 | |
| Discount on Bonds Payable ($100,000 − $99,918.42) | | $ 81.58 |
| Reserve for Bond Redemption Premium ($100,415.97 − $100,000) | | 415.97 |
| Cash | | 2,500.00 |

**Bonds bought or sold on yield basis between interest dates with accrued interest.** If $A_L$ represents the value of the bonds at the last regular interest payment date, and $1/p$ the fraction that the time since the last interest payment date is of the regular interest payment period, the theoretical value of a bond sold between interest dates with accrued interest is:

$$A = A_L + \{[(1 + y)^{1/p} - 1] \times A_L\} = A_L(1 + y)^{1/p}$$

This mathematically correct formula is impracticable as the available $(1 + y)^{1/p}$ tables are usually inadequate, and buyers of bonds between interest dates are required by custom to pay:

$$A = A_L + (A_L \times y \times 1/p)$$

When $1/p$ is computed by counting days, the date of sale should not be included.

The above formula applies only if the bonds are sold on a strictly yield basis. If they are sold at a certain price and accrued interest, the buyer would pay the sum of the quoted price and simple accrued interest at the coupon rate from the last interest payment date to the date of the sale.

### *Illustrative Problem*

Evaluate the bonds in Case No. 1 in the above problem if the date of sale had been July 31, 1950, instead of June 30, 1950.

### *Solution*

June 30, 1950, valuation taken from Case No. 1 is $97,291.40.

$$A = \$97{,}291.40 + (\$97{,}291.40 \times .03 \times 1/6) = \$97{,}777.86$$

**Proof of Accuracy**

| Period | Nominal Interest | Effective Interest | Bond Discount | Carrying Value |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $97,291.40 |
| 6/30/50–12/31/50 | $2,500.00 | $2,918.74 | $418.74 | 97,710.14 |
| 6/30/50–7/31/50 | 416.67A | 486.46A | 69.79A | 97,361.19 |
| 7/31/50–12/31/50 | 2,083.33B | 2,432.28B | 348.95B | 97,710.14 |
| 12/31/50–6/30/51 | 2,500.00 | 2,931.30 | 431.30 | 98,141.44 |
| 6/30/51–12/31/51 | 2,500.00 | 2,944.24 | 444.24 | 98,585.68 |
| 12/31/51–6/30/52 | 2,500.00 | 2,957.57 | 457.57 | 99,043.25 |
| 6/30/52–12/31/52 | 2,500.00 | 2,971.30 | 471.30 | 99,514.55 |
| 12/31/52–6/30/53 | 2,500.00 | 2,985.45 | 485.45 | 100,000.00 |

NOTES

1. Figures designated A are 1/6 of those on second line.
2. Figures designated B are 5/6 of those on second line.
3. Since the slight error caused by applying a 6-month rate on a 5-month period should be removed as soon as possible, the amortization schedule should carry the correct carrying value after the first interest coupons have been cashed. The above schedule is the same as the one shown on page 268 for Case 1, except for the two extra lines which divide the first period's entries 1/6 and 5/6, respectively.
4. Since these bonds are 35 months from maturity, the straight line amortization of the discount is [1/35 × ($100,000 − $97,361.19)] or $75.3945 per month. The 5-month amortization for the period between July 31, 1950, and December 31, 1950, is $376.97, and the regular 6-month amortization is $452.37. At any time during the life of a bond after the initial amortization, the effective interest method carrying value is greater than the one derived by using the straight line method if a premium is involved; the reverse is true if a discount is involved.
5. The journal entries for the early life of the bonds are:

| | Scientific Method | | Straight Line Method | |
|---|---|---|---|---|
| July 31, 1950 | | | | |
| Cash | $97,777.86 | | $97,777.86 | |
| Bond Discount | 2,638.81 | | 2,638.81 | |
| Bond Interest | | $ 416.67 | | $ 416.67 |
| Bonds Payable | | 100,000.00 | | 100,000.00 |
| December 31, 1950 | | | | |
| Bond Interest | 2,848.95 | | 2,876.97 | |
| Bond Discount | | 348.95 | | 376.97 |
| Cash | | 2,500.00 | | 2,500.00 |
| June 30, 1951 | | | | |
| Bond Interest | 2,931.30 | | 2,952.37 | |
| Bond Discount | | 431.30 | | 452.37 |
| Cash | | 2,500.00 | | 2,500.00 |

**Partial redemption of unmatured bonds.** When bonds are purchased by the issuing corporation, a prorata share of the unamortized bond premium or discount at date of purchase should be closed to Profit (or Loss) on Bonds Retired. After posting the entry to the Bond Discount or Bond Premium caused by the retirement, the remaining discount or premium is amortized according to the usual procedure. This prorata procedure may be used with either the scientific or straight line method of amortization if the bonds are not serial bonds (see page 276).

***Illustrative Problem***

Give the entry for the ex-interest purchase by the issuer of $10,000 par of the bonds in Case No. 1 of the problem on page 267 for $9,800 on June 30, 1951, and the resulting amortization table if the scientific method were used.

*Solution*

| | | |
|---|---|---|
| Bonds Payable (or Treasury Bonds) | $10,000.00 | |
| Bond Discount | | $ 185.86 |
| Cash | | 9,800.00 |
| Profit on Bonds Retired [(.10 × $98,141.44) − $9 800] | | 14.14 |

To retire bonds; values taken from table on page 268.

| Date | Cash Cr. | Bond Interest Dr. | Bond Discount Cr. | Bonds Payable Dr. | Carrying Value |
|---|---|---|---|---|---|
| 6/30/50 | ..... | ..... | ..... | ..... | $97,291.40 |
| 12/31/50 | $2,500.00 | $2,918.74 | $418.74 | ..... | 97,710.14 |
| 6/30/51 | 2,500.00 | 2,931.30 | 431.30 | ..... | 98,141.44 |
| 6/30/51 | 9,800.00 | ..... | 185.86 | $10,000.00 | 88,327.30* |
| 12/31/51 | 2,250.00 | 2,649.82 | 399.82 | ..... | 88,727.12 |
| 6/30/52 | 2,250.00 | 2,661.81 | 411.81 | ..... | 89,138.93 |
| 12/31/52 | 2,250.00 | 2,674.17 | 424.17 | ..... | 89,563.10 |
| 6/30/53 | 2,250.00 | 2,686.90 | 436.90 | ..... | 90,000.00 |

* $98,141.44 + $185.86 − $10,000.00 = $88,327.30.

**Determination of yield.** Ordinarily the yield for bonds purchased between interest dates is found by deducting the accrued interest from the "with interest" purchase price and by considering the bonds to have been purchased on the coupon date nearest the actual date of purchase. The choice of method to be used in approximating the value of $y$ when the price of the bonds is known depends upon the degree of accuracy needed. To show the difference in the accuracy of the different methods, the following problem will be solved by different procedures.

***Illustrative Problem***

Determine the effective semiannual yield of a bond, par $1,000, 5 per cent per annum, payable semiannually, to be redeemed at $1,020 in 3 years, if it were sold originally for $990.

Note: This bond is almost the same as the one in Case 3 on page 267, so $y$ is a little less than 3 per cent.

*Rule of thumb method.* If a probable error of less than .02 per cent is satisfactory, or if trial rates for use in other methods must be selected, the effective yield per interest payment period may be approximated by using the following formula, which employs only the ordinary bond valuation symbols:

$$y = 1/2 \times \left[ \frac{Pc - \frac{A - M}{n}}{A} + \frac{Pc - \frac{A - M}{n}}{M + \frac{A - M}{n}} \right]$$

*Solution to Illustrative Problem*

$$y = 1/2 \times \left[ \frac{\$25 - \frac{\$990 - \$1{,}020}{6}}{\$990} + \frac{\$25 - \frac{\$990 - \$1{,}020}{6}}{\$1{,}020 + \frac{\$990 - \$1{,}020}{6}} \right] = 0.029929$$

*Bond or compound interest table method.* The probable error, when interpolation (see method applied to annuities on page 212) is done using interest rates, is less than one twentieth of the difference between the rates used. As most bond tables have interest rates with smaller intervals than ordinary compound interest tables, using bond tables will give the more accurate approximation for bonds redeemable at par.

*Solution to Illustrative Problem*

Using bond formula No. 1 and letting $y$ equal .03:

$$A = \frac{(\$1{,}020 \times .03) - \$25 + \$25(1.03)^6}{.03(1.03)^6} = \$989.66$$

Using ordinary compound interest tables, the rate immediately less than .03 is either .0275 or .025. Either rate can be used, but the probable error is considerable. The valuation of a bond redeemable at par when $y$ is .0295 as taken from a bond table may be equated to formula No. 1 and the valuation for $(1.0295)^6$ obtained. Then using $y$ as .0295,

$$A = \frac{(\$1{,}020 \times .0295) - \$25 + \$25(1.0295)^6}{.0295(1.0295)^6} = \$992.38$$

| % | Valuation | % | Valuation |
|---|---|---|---|
| 2.95 | \$992.38 | 2.95 | \$992.38 |
| 3.00 | 989.66 | $y$ | 990.00 |
| $-$ 0.05 | \$ 2.72 | $-x$ | \$ 2.38 |

$$-0.05 : 2.72 = -x : 2.38$$
$$x = 0.04375$$
$$y = 2.95 + x = 2.99375$$

*Calculating machine method.* In order to use the iteration method,[91] bond formula No. 1 is expressed as follows:

$$Ay(1 + y)^n = My - cP + cP(1 + y)^n$$

The valuation of $(1 + y)^n$ must be computed by use of logarithms or a calculating machine. The valuations for the left and right members of the equation should be tabulated, and, if the value of the right member exceeds the value of the left member, the rate should be increased; if the

[91] Lyons, H., *Investment* (Boston: Houghton Mifflin Company, 1926), pp. 529–530.

value of the left member exceeds the value of the right member, the rate should be decreased. The semiannual yield lies between .029938 and .0299381; a closer approximation could be obtained by using a calculating machine with 10 rows of keys. The method is very practical as raising $(1 + y)$ to the $n$th power involves few multiplications on the calculating machine.

*Solution to Illustrative Problem*

| $y$ | $Ay(1 + y)^n$ | $My - cP + cP(1 + y)^n$ | Rate |
|---|---|---|---|
| .02995 | 35.393938[a] | 35.391615[b] | Too high |
| .02994 | 35.380058 | 35.379675 | Too high |
| .029938 | 35.377285 | 35.377290 | Too low |
| .0299381 | 35.377421 | 35.377407 | Too high |

*a.* $990 \times .02995 \times (1.02995)^6 = 35.393938$.
*b.* $(1020 \times .02995) - 25 + [25 \times (1.02995)^6] = 35.391615$.

*Elimination of residues method.* If bond tables are available and only reasonable accuracy is required in connection with bonds redeemable at par, considerable time can be saved by using the elimination of residues method.[92] If a $1,000 bond, 5 per cent payable annually, due in 3 years, is purchased for $1,030 plus one month's interest, $4.17, the bond would be capitalized at the closest tabulated valuation and the difference between the bond table value and the "flat" price closed to Interest Income. Subsequent amortizations can then be read from the bond table. The investor's entries would be:

**At Date of Purchase**

| | | |
|---|---|---|
| Bond Investment | $1,028.01 | |
| Accrued Interest Income | 4.17 | |
| Interest Income | 1.99 | |
| Cash | | $1,034.17 |

Bond capitalized at 3-year, 5% bond valuation in bond tables closest to "flat" price; see figure on 4% yield line in excerpt on page 266.

**At Date of First Interest Payment**

| | | |
|---|---|---|
| Cash | $ 25.00 | |
| Accrued Interest Income | | $ 4.17 |
| Bond Investment | | 4.44 |
| Interest Income | | 16.39 |

Amortization read from bond tables by subtracting 2½-year valuation from 3-year valuation on 4% yield line; i.e., $1,028.01 − $1,023.57 = $4.44.

[92] Cole, W. M., *Accounts: Their Construction and Interpretation* (Boston: Houghton Mifflin Company, 1908), pp. 148–149; Sprague, C. E., and Perrine, L.L., *The Accountancy of Investment* (New York: Ronald Press Company, 1914), pp. 100–104.

**Short terminal bonds.** Short terminal bonds may be distinguished from bonds sold between interest dates because short terminal bonds start bearing interest on the date of issue while bonds sold between interest dates are sold with accrued interest and bear interest from the last normal interest date. The commonly used valuation procedure for short terminal bonds given below is not mathematically perfect as $c$ and $y$ are applied proratably over part of an interest period. There may be a short terminal period both before and after the regular interest periods; it makes no difference which short terminal period is adjusted for first, although the formula below adjusts for the initial short terminal period first.

If the value of the bonds per dollar of par value is $V_n$ for $n$ 6-month interest periods; $V_{nt_1}$, for $n$ 6-month interest periods plus the short initial terminal period; $V_{nt_1t_2}$, for $n$ 6-month interest periods plus both short terminal periods; and if $f_1$ and $f_2$ are the number of months in the initial and final short terminal periods respectively, the formulas for short terminal bonds are:

$$V_n = 1 - (y - c)a_{\overline{n}|y}$$

$$V_{nt_1} = \left[V_n + \frac{c \times f_1}{6}\right] \div \left[1 + \frac{y \times f_1}{6}\right]$$

$$V_{nt_1t_2} = \left[V_{nt_1} + \frac{c \times f_2}{6}\right] \div \left[1 + \frac{y \times f_2}{6}\right]$$

$$A = V_{nt_1t_2} \times P$$

***Illustrative Problem***

Calculate the value of a \$10,000 bond, due at par on August 1, 1953, 5 per cent payable semiannually on January 1 and July 1, interest for 3 months paid on January 1, 1951, and for one month paid at maturity, sold on 6 per cent basis, compounded semiannually, on October 1, 1950.

*Solution*

$$V_n = 1 - (.03 - .025)a_{\overline{5}|.03} = 0.977101$$

$$V_{nt_1} = \left[0.977101 + \frac{.025 \times 3}{6}\right] \div \left[1 + \frac{.03 \times 3}{6}\right] = 0.974976$$

$$V_{nt_1t_2} = \left[0.974976 + \frac{.025 \times 1}{6}\right] \div \left[1 + \frac{.03 \times 1}{6}\right] = 0.974272$$

$$A = 0.974272 \times \$10{,}000 = \$9{,}742.72$$

**Proof of Accuracy and Issuer's Entries**

| Period | Cash Cr.[a] | Bond Interest Dr.[b] | Bond Discount Cr. | Carrying Value |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $ 9,742.72 |
| 10/1/50–1/1/51 | $125.00 | $146.14 | $21.14 | 9,763.86 |
| 1/1/51–7/1/51 | 250.00 | 292.92 | 42.92 | 9,806.78 |
| 7/1/51–1/1/52 | 250.00 | 294.20 | 44.20 | 9,850.98 |
| 1/1/52–7/1/52 | 250.00 | 295.53 | 45.53 | 9,896.51 |
| 7/1/52–1/1/53 | 250.00 | 296.89 | 46.89 | 9,943.40 |
| 1/1/53–7/1/53 | 250.00 | 298.30 | 48.30 | 9,991.70 |
| 7/1/53–8/1/53 | 41.67 | 49.97 | 8.30 | 10,000.00 |

*a.* For full periods, 0.025 × $10,000; for short initial period, ($\frac{3}{6}$ × 0.025) × $10,000; for short terminal period, ($\frac{1}{6}$ × 0.025) × $10,000.

*b.* For full periods, 0.03 times previous carrying value; for short initial period, ($\frac{3}{6}$ × 0.03) times previous carrying value; for short terminal period, ($\frac{1}{6}$ × 0.03) times previous carrying value.

**Annual bonds.** When both the coupon and yield rates are annual, the ordinary bond formulas can be used without any modifications. When the coupon rate is annual and the yield rate is semiannual, $y$ must be converted to an annual rate before the valuation formulas are used (see Illustrative Problem No. 5 for Makeham formula on page 230) and before the Bond Interest figures are computed in the amortization table.

**Quarterly bonds.** When both the coupon and yield rates are quarterly, the ordinary bond formula can be used without any modifications (see Illustrative Problem No. 6 for Makeham formula on page 230). When the coupon rate is quarterly and the yield rate is semiannual, $y$ must be converted to a quarterly rate before the valuation formulas are used (see Illustrative Problem No. 7 for Makeham formula on page 230) and before the Bond Interest figures are computed in the amortization table.

**Irredeemable bonds.** Irredeemable bonds are unlimited promises to pay interest which are expressed in terms of an ideal par value. As the purchaser buys an ordinary perpetuity having $Pc$ as the periodic payments, the valuation formula is:

$$A = \frac{Pc}{y}$$

Using this formula on Illustrative Problem No. 9 for the Makeham formula given on page 231, the equation becomes:

$$A = \$90{,}000 \times \frac{.025}{.03} = \$75{,}000 \text{ (same valuation by Makeham formula)}$$

Irredeemable bonds should be recorded at cost and the full interest payment taken up as realized income by the investor.

**Serial bonds.** Serial bonds are bonds that mature at various dates. They may be evaluated by using the ordinary bond formulas on the parts of the issue maturing at each date and then adding these valuations. If serial

bonds mature so that the redemption payments may be classified into one or more annuities, the Makeham formula may be used advantageously in their evaluation.

*Illustrative Problem*

Find the value of $20,000 of serial bonds bearing 3 per cent interest half-yearly, to yield 2 per cent interest half-yearly, maturing $10,000 in 2 years and $10,000 in 3 years.

*Annotated Solution*

Using bond formula No. 2,

$$A = [\$10{,}000 + (\$100 \times a_{\overline{4}|.02})] + [\$10{,}000 + (\$100 \times a_{\overline{6}|.02})]$$
$$= \$10{,}380.77 + \$10{,}560.15 = \$20{,}940.92$$

This solution agrees with that of Illustrative Problem No. 9 for the Makeham formula on page 23.

**Proof of Accuracy and Issuer's Entries**

| Period | Cash Cr. | Bond Interest Dr. | Bond Premium Dr. | Bonds Payable Dr. | Carrying Value |
|---|---|---|---|---|---|
| 0 | ..... | ..... | ..... | ..... | $20,940.92 |
| 1 | $ 600.00 | $418.82 | $181.18 | ..... | 20,759.74 |
| 2 | 600.00 | 415.19 | 184.81 | ..... | 20,574.93 |
| 3 | 600.00 | 411.50 | 188.50 | ..... | 20,386.43 |
| 4 | 600.00 | 407.73 | 192.27 | ..... | 20,194.16 |
| 4 | 10,000.00 | ..... | ..... | $10,000.00 | 10,194.16 |
| 5 | 300.00 | 203.88 | 96.12 | ..... | 10,098.04 |
| 6 | 300.00 | 201.96 | 98.04 | ..... | 10,000.00 |
| 6 | 10,000.00 | ..... | ..... | 10,000.00 | ..... |

If it is desired to amortize the bonds by series, the amortization procedure may be performed as though each series is a separate problem. For the bonds in the illustrative problem, the amortization table by series is:

| Period | Cash Cr. | Bond Interest Dr. | Bond Premium Dr. | Bonds Payable Dr. | Carrying Value |
|---|---|---|---|---|---|
| *4-Coupon Series* | | | | | |
| 0 | ..... | ..... | ..... | ..... | $10,380.77 |
| 1 | $ 300.00 | $207.62 | $92.38 | ..... | 10,288.39 |
| 2 | 300.00 | 205.77 | 94.23 | ..... | 10,194.16 |
| 3 | 300.00 | 203.88 | 96.12 | ..... | 10,098.04 |
| 4 | 300.00 | 201.96 | 98.04 | ..... | 10,000.00 |
| 4 | 10,000.00 | ..... | ..... | $10,000.00 | ..... |
| *6-Coupon Series* | | | | | |
| 0 | ..... | ..... | ..... | ..... | $10,560.15 |
| 1 | $ 300.00 | $211.20 | $88.80 | ..... | 10,471.35 |
| 2 | 300.00 | 209.42 | 90.58 | ..... | 10,380.77 |
| 3 | 300.00 | 207.62 | 92.38 | ..... | 10,288.39 |
| 4 | 300.00 | 205.77 | 94.23 | ..... | 10,194.16 |
| 5 | 300.00 | 203.88 | 96.12 | ..... | 10,098.04 |
| 6 | 300.00 | 201.96 | 98.04 | ..... | 10,000.00 |
| 6 | 10,000.00 | ..... | ..... | $10,000.00 | ..... |

The net result is the same as when a combined-series table is prepared (see above). If a combined-series table is prepared at the issue of the bonds (this is ordinarily done) and an amortization table by series is needed later, the Carrying Value balance as of the latter date may be analyzed by series by valuing each series to its maturity.

Breaking up the amortization table by series of bonds simplifies the handling of redemptions before maturity date. If a $1,000 bond of the 6-coupon series were retired at the end of the third period for $1,029, the amortization table for the periods affected would be as follows:

| Period | Cash Cr. | Bond Interest Dr. | Bond Premium Dr. | Bonds Payable Dr. | Loss on Retirement Dr. | Carrying Value |
|---|---|---|---|---|---|---|
| 3 | ..... | ..... | ..... | ..... | .... | $10,288.39 |
| 3 | $1,029.00 | ..... | $28.84 | $1,000.00 | $.16 | 9,259.55 |
| 4 | 270.00 | $185.19 | 84.81 | ..... | .... | 9,174.74 |
| 5 | 270.00 | 183.49 | 86.51 | ..... | .... | 9,088.23 |
| 6 | 270.00 | 181.77 | 88.23 | ..... | .... | 9,000.00 |
| 6 | 9,000.00 | ..... | ..... | 9,000.00 | .... | ..... |

If the combined-series amortization table is used, bonds redeemed before maturity must be deducted at their value as determined by using the given coupon and yield interest rates and a life equal to the time between the actual redemption date and the scheduled maturity date. If a $1,000 bond of the 6-coupon series were retired at the end of the third period for $1,029, the deduction would be computed as follows:

$$V = [\$1{,}000 \times (1.02)^{-3}] + [\$30 \times a_{\overline{3}|.02}] = \$1{,}028.84$$

The combined-series amortization for the periods affected would be as follows:

| Period | Cash Cr. | Bond Interest Dr. | Bond Premium Dr. | Bonds Payable Dr. | Loss on Retirement Dr. | Carrying Value |
|---|---|---|---|---|---|---|
| 3 | ..... | ..... | ..... | ..... | .... | $20,386.43 |
| 3 | $ 1,029.00 | ..... | $ 28.84 | $ 1,000.00 | $.16 | 19,357.59 |
| 4 | 570.00 | $387.15 | 182.85 | ..... | .... | 19,174.74 |
| 4 | 10,000.00 | ..... | ..... | 10,000.00 | .... | 9,174.74 |
| 5 | 270.00 | 183.49 | 86.51 | ..... | .... | 9,088.23 |
| 6 | 270.00 | 181.77 | 88.23 | ..... | .... | 9,000.00 |
| 6 | 9,000.00 | ..... | ..... | 9,000.00 | .... | ..... |

The above schedules use the scientific method of amortization; the same problem is solved below by the two variations of the straight line method of amortization: (a) the bonds outstanding method, and (b) dollar periods method.

**Amortization Table under Bonds Outstanding Method**

| Period | Bonds outstanding | % | Premium amortized |
|---|---|---|---|
| 1 | $ 20,000.00 | 20 | $188.18 |
| 2 | 20,000.00 | 20 | 188.18 |
| 3 | 20,000.00 | 20 | 188.19 |
| 4 | 20,000.00 | 20 | 188.19 |
| 5 | 10,000.00 | 10 | 94.09 |
| 6 | 10,000.00 | 10 | 94.09 |
| | $100,000.00 | 100 | $940.92 |

**Amortization Table under Dollar Periods Method**

While the bonds outstanding method is reasonably satisfactory if the bonds are not retired before maturity, the use of the dollar periods method secures the same results as the bonds outstanding method and at the same time determines the premium or discount pertaining to each installment according to the straight line method.

**Allocation of Amortization to Bond Series**

| Series | Par | Periods outstanding | Dollar periods | Fraction | Amortization |
|---|---|---|---|---|---|
| 4-coupon | $10,000 | 4 | 40,000 | 40/100 | $376.37 |
| 6-coupon | 10,000 | 6 | 60,000 | 60/100 | 564.55 |
| | | | 100,000 | 100/100 | $940.92 |

**Allocation of Amortization to Periods**

| Period | 4-Coupon Bonds | 6-Coupon Bonds | Total |
|---|---|---|---|
| 1 | $ 94.09 | $ 94.09 | $188.18 |
| 2 | 94.09 | 94.09 | 188.18 |
| 3 | 94.10 | 94.09 | 188.19 |
| 4 | 94.09 | 94.10 | 188.19 |
| 5 | ..... | 94.09 | 94.09 |
| 6 | ..... | 94.09 | 94.09 |
| | $376.37 | $564.55 | $940.92 |

If a $1,000 bond of the 6-coupon series were retired at the end of the third period for $1,029, the amortization table would be:

**Allocation of Amortization to Periods**

| Period | 4-Coupon Bonds (As above) | 6-Coupon Bonds (As above) | 6-Coupon Bonds Retirement Inc.; Dec.* | 6-Coupon Bonds Adjusted | Total |
|---|---|---|---|---|---|
| 1 | $ 94.09 | $ 94.09 | ..... | $ 94.09 | $188.18 |
| 2 | 94.09 | 94.09 | ..... | 94.09 | 188.18 |
| 3 | 94.10 | 94.09 | $28.23 | 122.32 | 216.42 |
| 4 | 94.09 | 94.10 | 9.41* | 84.69 | 178.78 |
| 5 | ..... | 94.09 | 9.41* | 84.68 | 84.68 |
| 6 | ..... | 94.09 | 9.41* | 84.68 | 84.68 |
| | $376.37 | $564.55 | ..... | $564.55 | $940.92 |

The entry for the purchase and retirement would be:

| | | |
|---|---|---|
| Bonds Payable | $1,000.00 | |
| Bond Premium | 28.23 | |
| Loss on Bonds Retired | .77 | |
| Cash | | $1,029.00 |

*Yield of serial bonds.* The yield on serial bonds can be approximated by evaluating the bonds at two trial yield rates and then interpolating. This plan, simple in theory, is difficult to use because it is not easy to get close trial rates. If only reasonably close accuracy is required, the average life of the bonds may be determined by the bonds outstanding method, and the yield determined by interpolating with valuations from bond tables.

### *Illustrative Problem*

Find the nominal annual yield on $60,000 (par) semiannual serial bonds, 6 per cent, maturing $10,000 in 1 year, $20,000 in 2 years, and $30,000 in 3 years, if the entire issue sold for $61,297.

### *Solution*

The bonds outstanding at the start of the 3 years were $60,000, $50,000, and $30,000, so the total issue of $60,000 was outstanding an average of (140,000 ÷ 60,000) or two and one-third years.

The necessary valuations of bonds, life two and one-third years, may be had by interpolating between values for bonds of two and two and one-half years. The use of bond tables is much more expedient than the use of annuity tables, because a rough approximation of the rate may be made at once. Interpolating, using figures from Montgomery Rollins' *Tables of Bond Values*, the following is obtained:

| | Valuation of $100 Bond | | |
|---|---|---|---|
| Yield | 2 Years | 2½ Years | 2⅓ Years |
| 4.90 | 102.07 | 102.56 | 102.423 |
| 5.00 | 101.88 | 102.32 | 102.173 |
| 5.10 | 101.69 | 102.09 | 101.956 |

Since the price was ($61,297 ÷ 60,000) or $102.1616, the rate is between 5.00 and 5.10.

| Rate | Valuation | Rate | Valuation |
|---|---|---|---|
| 5.00 | 102.173 | 5.00 | 102.1730 |
| 5.10 | 101.956 | $y$ | 102.1616 |
| −0.10 | 0.217 | $-x$ | 0.0114 |

$$-0.10 : 0.217 = -x : 0.0114$$

$$x = 0.0052$$

$y = 5.00 + x = 5.0052$, the nominal annual yield

*Annuity bonds.* Annuity bonds are serial bonds which are repaid at interest payment dates in such installments that the sum of the interest and principal repaid is as nearly constant as the denominations of the issue permit. A tentative debt retirement schedule may be prepared by making a series of solutions to the following formula when $t$ increases from unity to $n$:

$$DR = \frac{P}{s_{\overline{n}|c}} \times (1 + c)^{t-1}$$

A revised debt schedule could be obtained by subtracting the largest possible par value of bonds within the sum of the tentative retirement figure plus any balance remaining from previous periods. Annuity bonds are especially adapted for use by governmental agencies which must raise the interest and redemption money by tax levies. An illustration of the preparation of the revised debt schedule, and the valuation and the amortization of discount and premium on annuity bonds is given in (1948) Newlove-Smith-White 268.

**Financial decisions concerning bonds.** The decisions concerning bonds sometimes involve the computation of future yields and sometimes the determination of savings in future costs.

*Issuer's decision on option to call.* The decision of the issuing corporation as to whether or not to exercise an option to call its outstanding bonds involves the question of future costs rather than past costs. If $S$ denotes the saving by refinancing, $R$ the call redemption price of the bonds, $p$ the effective half-yearly rate on future borrowings, $P$, $M$, and $c$ their usual meanings, and $u$ the unexpired number of interest payment periods, the equation (based on bond formula No. 3) is: [93]

$$S = [M \times (1 + p)^{-u}] + [Pc \times a_{\overline{u}|p}] - R$$

*Purchaser's estimate of date when callable bonds will be redeemed.* The general rule is that investors should calculate the yield of the bonds in question as though purchased at the call date at the redemption price. If this yield is less than the effective interest demanded by the investor, he should assume that the option will not be taken. If this yield is more than the effective interest demanded by the investor, he should expect the option to be exercised.

In order to reduce the labor of applying the general rule, the following specific rules [94] may be substituted for it:

[93] (1948) Newlove-Smith-White 271–272.

[94] Moore, J. H., *Handbook of Financial Mathematics* (New York: Prentice-Hall, Inc., 1929), p. 536; Chamberlain, L., and Edwards, G. W., *The Principles of Bond Investment* (New York: Henry Holt and Company, 1927), pp. 560–561.

| Purchase Price | Call Price | Probable Call Date |
|---|---|---|
| At or below call price | At par, or at a discount, or a premium | Ultimate maturity date |
| Above call price | At par or at discount | Earliest call date |
| Above call price | Above par | Earliest call date when price computed on yield to maturity is greater than call price |
| Above call price | Above par | Ultimate maturity date when price computed on yield to maturity is less than call price |

### *Illustrative Problem*

The 6 per cent bonds of Company X, par $100, due in fourteen and one-half years, are callable after ten years. Give the probable call date if:

| Case | Purchase Price | Call Price |
|---|---|---|
| A | $ 95.35 | $105.01 |
| B | 104.95 | 99.03 |
| C | 115.85 | 103.99 |
| D | 110.23 | 108.16 |

### *Solution under General Rule*

| Case | Yield to maturity if bought at purchase price | Yield if bought on call date at call price | Probable redemption date |
|---|---|---|---|
| A | 6½ | 4¾ | Ultimate maturity date |
| B | 5½ | 6¼ | Call date |
| C | 4½ | 5 | Call date |
| D | 5 | 4 | Ultimate maturity date |

### *Solution under Specific Rules*

| Case | Price of $100 bond, life 4½ years | | Call price | Probable redemption date |
|---|---|---|---|---|
| | Yield (%) | Amount | | |
| A | * | * | * | Ultimate maturity date |
| B | * | * | * | Call date |
| C | 4½ | $106.05 | $103.99 | Call date |
| D | 5 | 103.99 | 108.16 | Ultimate maturity date |

* Information not needed.

After the probable call date has been estimated, the determination of the price or yield of callable bonds is found by the methods used in connec-

tion with ordinary bonds having the same par value, maturity value, cash interest rate, and probable life.

*Issuer's decision to retire one of several issues.* The decision of the issuing corporation as to which of its issues of bonds outstanding should be redeemed involves a question as to which redemption will cause the greatest saving of future costs. If $PBR$ is the par value of the bonds which can be redeemed by the funds available, $c$ the coupon rate of the bonds to be redeemed, $u$ the unexpired number of interest payment periods, and $p$ the effective half-yearly rate on future borrowings, the saving by retiring bonds from each issue, $S$, should be computed by using the following equation: [95]

$$S = [PBR \times (1 + p)^{-u}] + [PBR \times c \times a_{\overline{u}|p}]$$

The issue with the largest value for $S$ should be retired.

*Issuer's choice of several underwriters' bids.* The decision of the issuing corporation as to which underwriter's bid on alternate bond issues should be accepted involves letting the underwriter's bid for each proposed bond issue equal the present worth of periodic payments to pay the bond interest and to establish the sinking fund to retire the bonds. If $B$ is the underwriter's bid for the series, $P$ the total par value to be issued, $n$ the number of interest payment periods in life of bonds, $f$ the interest rate earned by the sinking fund, $c$ the half-yearly coupon interest of the bond, and $i$ the effective interest the bonds would cost the issuer, the equation is: [96]

$$B = \{[P \div s_{\overline{n}|f}] + Pc\}\, a_{\overline{n}|i}$$

The approximate value for $i$ should be obtained by interpolation, and the issue with the lowest value of $i$ should be chosen.

## Mortgages

**Kinds of mortgages.** Classified by their provisions for the repayment of principal, mortgages may be grouped as follows:

1. Ordinary mortgages when entire principal comes due at one date
2. Serial-plan mortgages when the principal matures at several dates
3. Amortization-plan mortgages when the contract calls for a series of equal periodic sums to pay both principal and interest

Ordinary mortgages involve the same mathematical problems found in ordinary bonds.

**Serial-plan mortgages.** While serial-plan mortgages may be handled by the rules given above for serial bonds, a special case of serial-plan mortgages is common enough to warrant the use of a special valuation formula which

[95] Rieffel, 14 *American Accountant* 607–608; (1948) Newlove-Smith-White 270–271.

[96] Schlauch, W. S., and Lang, T., *Mathematics of Business and Finance* (New York: Ronald Press Company, 1937), pp. 426–429; Gushee, C. H., *Financial Compound Interest and Annuity Tables* (Boston: Financial Publishing Company, 1942), pp. 806–809.

greatly lessens the work of valuation. The present worth of a serial-plan mortgage, original face value $D$, payable in $n$ equal periodic payments of $I$, with periodic payments of interest at $d$ per cent effective per payment interval on the reducing balance of principal, computed on the basis of an effective interest rate of $c$ per cent per payment interval is equal to the following:

$$A = I \times \left\{ a_{\overline{n}|c} + \left[ \frac{d}{c} \times (n - a_{\overline{n}|c}) \right] \right\}$$

*Illustrative Problem*

Find the price of a serial-plan mortgage, face value $10,000 payable in 4 equal periodic payments, with interest on the outstanding indebtedness at 6 per cent effective, sold to yield 7 per cent effective.

*Solution*

$$A = \$2{,}500 \times \left\{ a_{\overline{4}|.07} + \left[ \frac{.06}{.07} \times (4 - a_{\overline{4}|.07}) \right] \right\} = \$9{,}781.15$$

This answer agrees with the solution of Makeham Formula Illustrative Problem No. 10, given on page 231.

**Proof of Accuracy and Investor's Entries**

| (1) End of Period | (2) Cash Dr. | (3) Interest Cr.[b] | (4) Mortgage Dr.[c] | (5) Mortgage Cr. | (6) Mortgage Balance |
|---|---|---|---|---|---|
| 0 | ..... | ..... | ..... | ..... | $9,781.15 |
| 1 | $ 600.00[a] | $684.68 | $84.68 | ..... | 9,865.83 |
| 1 | 2,500.00 | ..... | ..... | $2,500.00 | 7,365.83 |
| 2 | 450.00[a] | 515.61 | 65.61 | ..... | 7,431.44 |
| 2 | 2,500.00 | ..... | ..... | 2,500.00 | 4,931.44 |
| 3 | 300.00[a] | 345.20 | 45.20 | ..... | 4,976.64 |
| 3 | 2,500.00 | ..... | ..... | 2,500.00 | 2,476.64 |
| 4 | 150.00[a] | 173.36 | 23.36 | ..... | 2,500.00 |
| 4 | 2,500.00 | ..... | ..... | 2,500.00 | ..... |

*a*. Unpaid face value of principal times .06.
*b*. Balance of column (6) at start of period times .07.
*c*. Column (3) minus column (2).

**Amortization-plan mortgages.** While amortization-plan mortgages could merely represent an ordinary amortization of a debt, business practice makes them have round sums for the installment payments ($I$). This causes a small balance of principal ($UD_t$) to be due immediately after the last regular payment is made. The formulas for $UD_t$ and $AD_t$ given on page 236 apply here as do the rules for the Case B amortization table. In addition a formula is needed to compute the debtor's equity after $t$ amortization payments are made; this formula is:

$$E = (I - dD) \times soa \text{ (for } t \text{ periods at } p \text{ rate effective)}$$

### *Illustrative Problem*

An amortization-plan mortgage, original balance $10,000, is to be paid except for a small balance by 4 annual payments of $2,875 (includes both principal and interest). Interest on both the debt and payments is 6 per cent per annum effective.

Part 1. Compute the unpaid balance after the fourth payment.

Part 2. Compute principal retired by fourth payment.

Part 3. Compute equity of debtor after third payment.

*Solution*

PART 1

$$UD_4 = \$10{,}000 - \{[\$2{,}875 - (.06 \times \$10{,}000)] \times s_{\overline{4}|.06}\} = \$47.75$$

PART 2

$$AD_4 = [\$2{,}875 - (.06 \times \$10{,}000)] \times (1.06)^3 = \$2{,}709.56$$

PART 3

$$E_3 = [\$2{,}875 - (\$10{,}000 \times .06)] \times s_{\overline{3}|.06} = \$7{,}242.69$$

**Proof of Accuracy and Entries of Debtor**

| End of Period | Cash Cr. | Interest Dr. | Debt Dr. | Debt Balance |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $10,000.00 |
| 1 | $2,875.00 | $600.00 | $2,275.00 [a] | 7,725.00 |
| 2 | 2,875.00 | 463.50 | 2,411.50 [a] | 5,313.50 |
| 3 | 2,875.00 | 318.81 | 2,556.19 [a] | 2,757.31 |
| 4 | 2,875.00 | 165.44 | 2,709.56 | 47.75 |

a. Sum of these three payments on debt is debtor's equity after third payment.

*Investments in amortization-plan mortgages when no unpaid balance is to be paid at maturity.* This is a special case of the material covered in the next two subsections. Loans secured by real estate mortgages sometimes specify payments covering principal and interest calculated to retire the note and interest in even periods. If an investor pays face value for the note, the allocation of the payments between principal and interest would be as shown in Case B on page 237. If the note is acquired at a discount, the discount may be amortized using either the balance of nominal principal outstanding method or the effective yield method.

### *Illustrative Problem*

A note for $10,000 payable in 4 equal yearly payments including interest (6 per cent per annum on both note and payments) is purchased to yield 7 per cent per annum. Give the investor's tabulated entries: Case A, under the balance of nominal principal outstanding method; Case B, under the effective yield method.

*Annotated Solution*

The annual payment is $2,885.91 (see Case B on page 237).
The price paid for the note is: $2,885.91 × $a_{\overline{4}|.07}$ = $9,775.19.

CASE A

**Amortization of Nominal Principal**

(see Case B on page 237)

| Year | Payments | Interest | Amortization of Nominal Principal | Nominal Principal Balance |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $10,000.00 |
| 1 | $2,885.91 | $600.00 | $2,285.91 | 7,714.09 |
| 2 | 2,885.91 | 462.85 | 2,423.06 | 5,291.03 |
| 3 | 2,885.91 | 317.46 | 2,568.45 | 2,722.58 |
| 4 | 2,885.93 | 163.35 | 2,722.58 | ..... |

**Amortization of Discount on Basis of Nominal Principal at Start of Year**

| Year | Nominal Principal | | Amortization of Discount |
|---|---|---|---|
| | Balance | % of Total | |
| 1 | $10,000.00 | 38.8686 | $ 87.38 |
| 2 | 7,714.09 | 29.9836 | 67.41 |
| 3 | 5,291.03 | 20.5655 | 46.23 |
| 4 | 2,722.58 | 10.5823 | 23.79 |
| | $25,727.70 | 100.0000 | $224.81 |

**Tabulation of Investor's Entries**

| Year | Cash Dr. | Amortization of | | Mortgage Cr. | Income Cr. | Mortgage Balance |
|---|---|---|---|---|---|---|
| | | Nominal Principal | Discount | | | |
| 0 | ..... | ..... | ..... | ..... | ..... | $9,775.19 |
| 1 | $2,885.91 | $2,285.91 | $87.38 | $2,198.53 | $687.38 | 7,576.66 |
| 2 | 2,885.91 | 2,423.06 | 67.41 | 2,355.65 | 530.26 | 5,221.01 |
| 3 | 2,885.91 | 2,568.45 | 46.23 | 2,522.22 | 363.69 | 2,698.79 |
| 4 | 2,885.91 | 2,722.58 | 23.79 | 2,698.79 | 187.12 | ..... |

CASE B

**Tabulation of Investor's Entries**

| Year | Cash Dr. | Income Cr. | Mortgage Cr. | Mortgage Balance |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $9,775.19 |
| 1 | $2,885.91 | $684.26 | $2,201.65 | 7,573.54 |
| 2 | 2,885.91 | 530.15 | 2,355.76 | 5,217.78 |
| 3 | 2,885.91 | 365.24 | 2,520.67 | 2,697.11 |
| 4 | 2,885.91 | 188.80 | 2,697.11 | ..... |

To use the effective yield method is theoretically superior, but usually the effective yield must be found by interpolation in practice.

*Investments in amortization-plan mortgages when unpaid balance is to be paid at maturity.* If the yield to the investor is known, the problem is to determine the price of the investment and the amortization of this cost. If the yield is unknown but the price is known, the problem is to determine the approximate yield and to amortize the known cost.

When Yield is Known. The purchase price of an amortization-plan mortgage, after $t$ amortization payments have been made, face value $D$, originally to be amortized with $n$ periodic payments of $I$ (any unpaid balance to be paid at maturity), interest rate on the face value of the mortgage and on the amortization payments $p$ per cent per amortization payment period, and interest on the price to be paid by the investor $c$ per cent per amortization payment period, may be expressed as:

$$P = [I \times poa \text{ (for } (n - t) \text{ payments at } c \text{ rate effective)}] + \{(D - [(I - dD) \times soa \text{ (for } n \text{ payments at } p \text{ rate effective)}]) \times (1 + c)^{-(n-t)}\}$$

*Illustrative Problem*

Find what an investor desiring 7 per cent per annum effective can offer for an amortization-plan mortgage, face value \$10,000, immediately after the first of the 4 amortization payments of \$2,875 has been made (any unpaid balance to be paid at maturity); interest on the mortgage and on the amortization payments 6 per cent per annum effective.

*Solution*

$$P = [\$2{,}875 \times a_{\overline{3}|.07}] + \{[\$10{,}000 - ([\$2{,}875 - (.06 \times \$10{,}000)] \times s_{\overline{4}|.06})] \times (1.07)^{-3}\} = \$7{,}583.89$$

**Proof of Accuracy and Investor's Entries**

| End of Period | Cash Dr. | Income Cr. | Mortgage Cr. | Mortgage Balance |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | \$7,583.89 |
| 1 | \$2,875.00 | \$530.87 | \$2,344.13 | 5,239.76 |
| 2 | 2,875.00 | 366.78 | 2,508.22 | 2,731.54 |
| 3 | 2,875.00 | 191.21 | 2,683.79 | 47.75* |
| 3 | 47.75 | ..... | 47.75 | ..... |

* \$47.75 is correct valuation of $UD_t$ as per problem on page 285.

When Price Is Given but Yield Unknown. While the yield rate may be approximated by interpolating with valuations found by using the formula in the preceding paragraph followed by the preparation of an ordinary table of investor's entries, this procedure is cumbersome. A more convenient although not so accurate a method is given in the solution to the following problem.

*Illustrative Problem*

Tabulate the entries of an investor who paid $7,583.89 for an amortization-plan mortgage, original face value $10,000, immediately after the first of the 4 annual payments of $2,875 had been paid (any unpaid balance to be paid at maturity); interest on the mortgage and on the amortization payments 6 per cent per annum effective.

*Solution*

**Entries of Original Holder of Mortgage** (see page 285)

| End of Year | Cash Dr. | Interest Cr. | Mortgage Cr. | Mortgage Balance |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $10,000.00 |
| 1 | $2,875.00 | $600.00 | $2,275.00 | 7,725.00 |
| 2 | 2,875.00 | 463.50 | 2,411.50 | 5,313.50 |
| 3 | 2,875.00 | 318.81 | 2,556.19 | 2,757.31 |
| 4 | 2,875.00 | 165.44 | 2,709.56 | 47.75 |

**Amortization of Discount on Basis of Nominal Capital at Start of Year**

| Year * | Nominal principal | | Amortization of discount |
|---|---|---|---|
| | Balance | % of total | |
| 2 | $ 7,725.00 | 48.9054 | $ 69.01 |
| 3 | 5,313.50 | 33.6386 | 47.47 |
| 4 | 2,757.31 | 17.4560 | 24.63 |
| | $15,795.81 | 100.0000 | $141.11† |

* Year of life of original mortgage.
† $7,725.00 − $7,583.89 = $141.11.

**Tabulation of Investor's Entries**

| Year * | Cash Dr. | Amortization of Nominal Principal | Discount | Mortgage Cr. | Income Cr. | Mortgage Balance |
|---|---|---|---|---|---|---|
| 1 | ..... | ..... | ..... | ..... | ..... | $7,583.89 |
| 2 | $2,875.00 | $2,411.50 | $69.01 | $2,342.49 | $532.51 | 5,241.40 |
| 3 | 2,875.00 | 2,556.19 | 47.47 | 2,508.72 | 366.28 | 2,732.68 |
| 4 | 2,875.00 | 2,709.56 | 24.63 | 2,684.93 | 190.07 | 47.75 |
| 4 | 47.75 | ..... | ..... | 47.75 | ..... | ..... |

* Year of life of original mortgage; year of investment one less.

The discount may be amortized under the sum of the years' digits method, i.e., $\frac{3}{6}$ the first year, $\frac{2}{6}$ the second, and $\frac{1}{6}$ the third.[97] This method improves in accuracy as the length of the life of the mortgage increases.

*Plan to simplify accounting for amortization-plan mortgages.*[98] Realtors can arrange that the cash payment on the property sold reduce the amount of the amortization-plan mortgage until the face of the mortgage exactly

[97] Walton-Finney, 29 *Journal of Accountancy* 470–478.
[98] Little, 15 *American Accountant* 115–117.

equals the present worth of an annuity having a round sum of money as the period payment. For each plan of payment, the present worth of annuities for the usual monthly payments can be computed at the current monthly rate of interest and then tabulated. If interest is one-half per cent a month effective, those tables would be:

$a_{\overline{n}|.005}$ TABLES

| Monthly Payment | 10-Year Plan 120 Payments | 12-Year Plan 144 Payments | 15-Year Plan 180 Payments |
|---|---|---|---|
| $42 | $3,783.08 | $4,303.94 | $4,977.15 |
| 43 | 3,873.16 | 4,406.41 | 5,095.65 |
| 44 | 3,963.23 | 4,508.89 | 5,214.15 |
| 45 | 4,053.31 | 4,611.36 | 5,332.66 |

Similarly $AD_t$ tables showing the portion of the monthly payments applicable against principal (interest rate unchanged) can be tabulated. The following is an excerpt from such tables:

$AD_t$ TABLES FOR 12-YEAR PLAN

| Number of Payments | Amount of Monthly Payments $42.00 | $43.00 | $44.00 | $45.00 |
|---|---|---|---|---|
| 1 | $ 20.48 | $ 20.97 | $ 21.46 | $ 21.94 |
| 2 | 20.58 | 21.07 | 21.56 | 22.05 |
| 3 | 20.69 | 21.18 | 21.67 | 22.16 |
| ... | ..... | ..... | ..... | ..... |
| ... | ..... | ..... | ..... | ..... |
| 144 | 41.79 | 42.79 | 43.78 | 44.78 |
| Total | $4,303.94 | $4,406.41 | $4,508.89 | $4,611.36 |

***Illustrative Problem***

Give the entries for the first 2 months if a house is sold for $6,000 to a customer who is able to pay about $1,400 as down payment and $45 a month, interest on amortization-plan mortgage and repayments one-half per cent per month effective.

*Solution*

(Using statistics for $45 a month and 12-year plan)

At Date of Sale

| | | |
|---|---|---|
| Mortgage Receivable (see $a_{\overline{n}|.005}$ Tables) | $4,611.36 | |
| Cash | 1,388.64 | |
| Sales | | $6,000.00 |

At End of First Month

| | | |
|---|---|---|
| Cash | 45.00 | |
| Mortgage Receivable (see $AD_t$ Tables) | | 21.94 |
| Interest Income | | 23.06 |

At End of Second Month

| | | |
|---|---|---|
| Cash | $ 45.00 | |
| Mortgage Receivable | | $ 22.05 |
| Interest Income | | 22.95 |

**Industrial bank loan interest rates.** The interest rates paid by borrowers on industrial bank loans may be approximated by letting the face of the loan minus the sum of the discount deducted in advance and the service charges equal the present worth of the payments to be made by the borrower and then interpolating for $r$. The rates in the following illustrative problems are taken as the closest tabulated rate in order to save space; the interpolation technique, which will give closer approximations, is shown on page 273.

*Illustrative Problem No. 1*

Find the weekly rate paid by a borrower who pays 50 weekly payments of $2, starting one week hence, for $92 received by him (face value of note $100, discount $8).

*Solution*

$\$92 = \$2 \times a_{\overline{50}|r}$

$a_{\overline{50}|r} = 46.0$

$a_{\overline{50}|.00\frac{1}{3}} = 45.985$, so $\frac{1}{3}$ of 1 per cent per week is approximate rate

*Illustrative Problem No. 2*

An industrial bank adds 7 per cent to the amount borrowed and the monthly payments are made in 12 equal amounts starting one month hence. Find the monthly rate.

*Solution*

$\$1.00 = \$1.07 \times \frac{1}{12} \times a_{\overline{12}|r}$

$a_{\overline{12}|r} = 11.21495$

$a_{\overline{12}|.01} = 11.2551$, so rate is slightly over 1 per cent per month

**Installment contract interest rates.** The interest rates paid by purchasers of property on the installment plan may be approximated by letting the cash price minus any down payment equal the present worth of the payments to be made by the purchaser and then interpolating for $r$.

*Illustrative Problem No. 1*

An article sells for $140 cash, or $16 down and $20 a month for 8 months. Find the approximate interest rate per month.

*Solution*

$$\$140 - \$16 = \$20 \times a_{\overline{8}|r}$$

$$a_{\overline{8}|r} = 6.2$$

$a_{\overline{8}|.06} = 6.2098$, so rate is slightly over 6 per cent per month

***Illustrative Problem No. 2***

An article sells for \$20 cash, or \$4 down and \$4 per month for 4 months, with a payment of \$2.50 the fifth month. Find the approximate interest rate per month.

*Solution*

$$\$16 = [\$4 \times a_{\overline{4}|r}] + [\$2.50 \times (1 + r)^{-5}]$$

By trying various rates it is found that

$$\$16.1426 = [\$4 \times a_{\overline{4}|.05}] + [\$2.50 \times (1.05)^{-5}],$$

so rate is slightly over 5 per cent per month.

# CHAPTER 9

## Accounting for Fixed and Intangible Assets at Cost

**Introduction.** While the accounting for fixed and intangible assets has been discussed in part in preceding chapters of this text, many additional problems require attention at this point. As in the case of other accounting matters treated in this text, however, it is assumed that the student already has become familiar (from prior study or experience) with the more elementary phases of fixed asset accounting, such as (1) classification and terminology employed, (2) capital versus revenue expenditures, (3) general aspects of depreciation and amortization, (4) accounting for property dispositions and exchanges, and (5) the general merits of the proposition that the cost of fixed assets should be retained in the accounts. This leaves for consideration in this text such problems as (1) the mathematical aspects of property valuation, (2) the accounting for the appraised value as well as the cost of fixed assets, (3) the accounting effect of a change in the estimated service life of equipment and improvements to real estate, and (4) miscellaneous matters of significance in fixed asset accounting. The topics just listed are treated at length in this and Chapter 11.

**Planning fixed asset additions.** Many business firms, especially those engaged in manufacturing, have been confronted in recent years with a serious problem in the planning and controlling of their additions to fixed assets. Large sums are frequently involved in these additions and careful planning is a prime requisite if waste is to be avoided. One accountant has suggested the following plan of accounting control.[1] In the early fall of each year a series of conferences are held, attended by representatives from each of the operating departments and other persons responsible for product and machinery design. These people are asked to present data on their fixed asset needs in written memorandum form, including proposed asset costs, expected savings in future expenses, and quality of product improvements.

The needs of the several departments are then tabulated under three headings: (1) those additions and improvements which are absolutely essential to continue operations under normal conditions; (2) those items which help to improve the quality of the products; and (3) those additions which will either add to the quantity of output or are needed for some other purpose. While this information is being reviewed by the management, the treasurer of the firm prepares a detailed budget of cash for the succeeding year as well as a briefer cash budget for four more years. The

[1] Chiuminatto, 30 *N.A.C.A. Bulletin* 885–892 (adapted by permission; exhibits are direct quotations).

cash budget allows the management, if necessary, to assign the proposed projects priority numbers corresponding to the supply of funds. Of course, if sufficient funds are on hand or in sight to carry out all the additions, no ranking of the projects is necessary. The budget of fixed asset additions also includes an arbitrary sum for unplanned-for increases in cost or other contingencies.

After the fixed asset budget has been approved, the construction engineering department of the firm sets up a sheet similar to the following:

**Expenditure Control Sheet**

CAPITAL EXPENDITURES

Description Build new Digester in No. 4 Building

Started April 1, 19— Completed November 1, 19—

Estimated Cost $35,000

Revised Cost 41,000

Actual Cost 46,000

ORDER NUMBERS:
1721 May
1792 Oct.
1865 May
1894 Oct.
1920 June
1977 Sept.
2030 Oct.
2041 June

| | MONTH | YEAR | TOTAL |
|---|---|---|---|
| Totals | 19— forwarded | | $ 6,000 |
| Jan. | $7,000 | $ 7,000 | 13,000 |
| Feb. | 2,000 | 9,000 | 15,000 |
| Mar. | 4,000 | 13,000 | 19,000 |
| Apr. | 1,000 | 14,000 | 20,000 |
| May | 5,000 | 19,000 | 25,000 |
| June | 5,000 | 24,000 | 30,000 |
| July | 4,000 | 28,000 | 34,000 |
| Aug. | 6,000 | 34,000 | 40,000 |
| Sept. | 5,500 | 39,500 | 45,500 |
| Oct. | 500 | 40,000 | 46,000 |
| Nov. | | | |
| Dec. | | | |

Reason for Expenditure Replace old No. 1 Digester and increase daily production by 12 tons a day.

Estimated Annual Saving $20,000 43% on Investment

Actual Annual Saving $18,000 38% on Investment

The data on this form are kept up to date as the work on the plant asset progresses to completion. A summary for all the jobs in progress is prepared each month in the form illustrated below. The management thus

has information constantly at hand for control purposes; questions may be asked of those in charge of the fixed asset additions concerning the effectiveness of the expenditures. The data are also useful in helping to de-

JOB STATUS REPORT

To — Top Management
Vice-Pres. in Charge of Operations
DATE — MAY 15, 19— Engineering Department

The following jobs were scheduled to start on April 1 and as of this date are not yet started:

Rebuild Wet End of No. 2 Machine
New Warehouse
H.S. Single Roll Wrapper
New Drive for No. 3 Machine

The following jobs were to be completed by May 1, and are not yet completed:

Lawton Automatic Wrapper
New Grinder in Groundwood Plant
New Label Printing Machine

The following jobs have been completed:

| | Actual Cost | Estimated Cost | Difference |
|---|---|---|---|
| Replace No. 1 Digester.. | $ 46,000.00 | $ 41,000.00 | $ 5,000.00 |
| New Roofs No. 1-2-3-4 Bldgs..... | 10,000.00 | 10,000.00 | |
| Complete New Power Plant | 60,000.00 | 50,000.00 | 10,000.00 |
| Salesmen's Automobiles.. | 24,000.00 | 20,000.00 | 4,000.00 |
| | $140,000.00 | $121,000.00 | $19,000.00 |

Comparison of Estimated Savings:

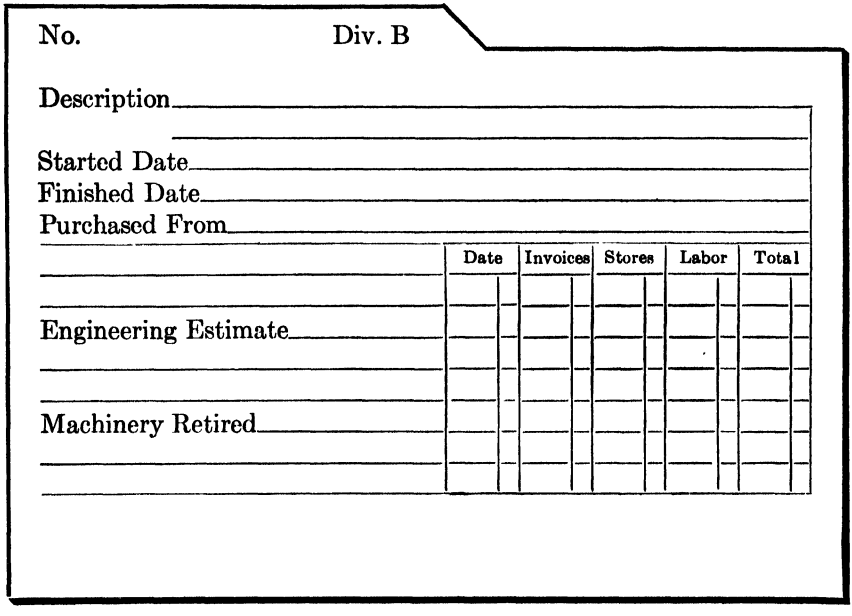
| | Actual | Estimated | Difference |
|---|---|---|---|
| New Power Plant..... | $18,000.00 | $16,000.00 | $ 2,000.00 |
| New Digester..... | 20,000.00 | 18,000.00 | 2,000.00 |

EXPENDITURE SURVEY

| | |
|---|---|
| Funds needed to complete jobs now under construction..... | $ 70,000.00 |
| Funds needed to complete jobs not started..... | 30,000.00 |
| Allowance for error in estimates 13%..... | 13,000.00 |
| | $113,000.00 |
| Depreciation for balance of year..... | 90,000.00 |
| Cash from working capital or profits..... | $ 23,000.00 |

termine whether funds will have to be borrowed (or securities sold) in order to complete the planned construction outlays.

In order to complete the accounting control over the projects in progress, an informational folder with a printed jacket may be used, similar to the following:




CONSTRUCTION COST RECORD FOLDER

The folder just illustrated is used to file the construction labor cost data, the statements for materials used, and an itemized list of old equipment retired because of the new addition. It may also be used by the accounting division to check on the authority for the project and the expenditures thereon.

**Accounting for the cost of moving fixed assets.** After a fixed asset is in place, it may be subsequently necessary to move it to another location. Assuming that this happens, what is the accounting treatment of the cost of the move or rearrangement? This question is usually answered through an inquiry as to whether the move added any material percentage of efficiency to the plant or item of equipment. If the use to which the asset is put is made more effective by the move, the cost of the transfer or relocation is charged to the Fixed Asset account, or to an Improvement account; the latter account is often used when the benefit from the move

will have a life less lengthy than the remaining life of the asset itself. The Improvement account may be treated as a deferred charge on the balance sheet and amortized over the years benefited by the move.[2]

When the fixed asset move is required by law, or for some other reason unrelated to the day by day use of the asset, the outlay for the transfer should be charged either to Earned Surplus or to an expense account, depending upon the treatment followed by the firm in the handling of unusual items (see Chapter 13).

As a practical example of the type of move contemplated in this section, suppose an electric power company is required by a city to move its poles twenty feet away from the street, and at the same time the company decides to install forty-foot poles instead of the thirty-foot ones previously in place.[3] The city agrees that the required move is permanent in nature and that no further transfers will be necessary within the foreseeable future. In this case, the difference between the cost of the longer poles and the replaced short ones should be charged to the Asset account; the labor involved in making the relocation, however, would be charged either to Earned Surplus or to an expense account. On the other hand, if the new permanent right of way adds significantly to the efficiency with which the company can do business, the Right of Way account should be charged with an estimated portion of the cost of making the move depending upon the value added by the relocation.

**Involuntary conversion of fixed assets.** When an asset is (1) destroyed by fire, act of God, stolen, or appropriated for public use, and (2) is replaced with the proceeds of insurance (if any) or payment from a governmental unit or utility, the transaction is called "involuntary conversion." For income tax purposes, any gain on an involuntary conversion is not ordinarily taxed if all of the proceeds are promptly reinvested in an asset similar to the one destroyed or condemned. Instead, the new asset takes a tax basis of the same amount as the old one plus any additional expenditure made to acquire the new asset. A loss from an involuntary conversion, on the other hand, is deductible in the tax year in which it is determined.[4]

If it is impractical or impossible to reinvest promptly the proceeds from the insurance or condemnation award, and if a gain has been realized on the involuntary conversion, a so-called "replacement fund" may be established by the taxpayer if he files an application with the government for permission to do so (a bond must be furnished in this case to assure the government that any future tax will be paid).

Suppose a building with a book value and tax basis of $20,000 is de-

[2] Walton, 19 *Journal of Accountancy* 480.
[3] Walton, 20 *Journal of Accountancy* 151.
[4] *Regulations 111*, Section 29.112(f)–1.

stroyed by fire. Insurance of $30,000 is received for the replacement of the asset. The entry would be:

| | | |
|---|---|---|
| Cash | $30,000 | |
| Reserve for Replacement of Building | | $30,000 |

Subsequently, $24,000 is used for actual replacement. The entries would be:

| | | |
|---|---|---|
| Reserve for Replacement | $24,000 | |
| Cash | | $24,000 |
| Reserve for Replacement | 6,000 | |
| Gain on Involuntary Conversion | | 6,000 |

The firm would then proceed to depreciate the new building on the basis of a $20,000 value.

Of course, if there is no intention to replace the building, the entry at the time of the fire is:

| | | |
|---|---|---|
| Cash | $30,000 | |
| Building (net) | | $20,000 |
| Gain on Involuntary Conversion | | 10,000 |

**Depreciation in an expanding business.** As is well known, accountants have developed several methods of determining the amount of depreciation which should be charged as an expense in measuring periodic income.[5] While a few of these methods take into consideration the problems peculiar to a rapidly growing firm, most accountants are inclined to adopt the straight line technique because of its simplicity and ease of calculation. It should be recognized, however, that the straight line method may prove relatively unsatisfactory in those firms which are adding abnormally large sums to their property accounts each year.[6] Assume, for example, that a business unit has been expanding its fixed properties at about 5 per cent per year and that property disposals average about 40 per cent of the periodic yearly depreciation amount. This combination would allow the Reserve for Depreciation account to remain in about the same percentage relationship (20%) to the total investment in plant and equipment. Further, if the 20 per cent is viewed as being satisfactory in the industry, the accountant should have no hesitancy in expressing his informed opinion as to the adequacy of the total depreciation reserve.

Suppose, however, that the business unit which has been adding about 5 per cent annually to its facilities begins to add a far larger sum, say 30 per cent; and further assume that this increased per cent continues for

[5] (1948) Newlove-Smith-White 128–141.
[6] Stanley, 87 *Journal of Accountancy* 478.

several years. The accountant is soon in a quandary as to the adequacy of the periodic and accumulated depreciation provisions since there is no standard of comparison which he can use. In order to show that a fast-growing firm's percentage of total depreciation reserve to the gross cost of the plant will not be kept up during periods of extraordinary expansion the following facts [7] may be assumed:

| | Co. A | Co. B |
|---|---|---|
| (1) Total gross depreciable plant | $1,000,000 | $1,000,000 |
| (2) Present accumulated depreciation expressed as percentage of depreciable property | 20% | 14% |
| (3) Straight line depreciation rate | 2.4% | 2.4% |
| (4) Weighted average of expired life of the recent plant additions | 2 years | 2 years |
| (5) Portion of plant constructed within past five years | 20% | 52% |

The following schedules show the effect on the plant and depreciation accounts of each of these companies.

| Company A (Slow rate of recent growth) | Plant additions within past five years (weighted average life of two years) | Plant additions prior to past five years | Total plant |
|---|---|---|---|
| Gross plant | $200,000 | $800,000 | $1,000,000 |
| Accumulated depreciation | 9,600 [a] | 190,400 [b] | 200,000 |
| Percentage of accumulated depreciation to gross plant | 4.8% | 23.8% | 20.0% |
| **Company B (Rapid rate of recent growth)** | | | |
| Gross plant | $520,000 | $480,000 | $1,000,000 |
| Accumulated depreciation | 24,960 [a] | 115,040 [b] | 140,000 |
| Percentage of accumulated depreciation to gross plant | 4.8% | 23.96% | 14.0% |

*a*. Rate of depreciation multiplied by weighted average expired life multiplied by dollar amount of plant constructed within five years.
*b*. Total accumulated depreciation less portion applicable to plant additions within past five years, as computed in *a* above.

Since the last column of the above schedule shows that the "percentage of accumulated depreciation to gross plant" has declined rapidly, it is suggested that the "growth" factor should be taken into consideration by accountants who are required to express the informed opinion about depreciation referred to previously in this section. The recognition of this factor could be accomplished by (1) choosing a term of years during which detailed property costs are available; (2) figuring separately an appropriate total depreciation allowance on the more recently acquired property; and (3) measuring the adequacy of the total Reserve for Depreciation "by the

[7] Based by permission on example in Stanley, 87 *Journal of Accountancy* 480.

percentage of the remaining accumulated depreciation to the older property." [8]

**Depreciation based on units of output.** There is a growing trend in accounting to adopt the units of output method of determining the periodic depreciation expense, especially for transportation equipment and manufacturing machinery. The increased popularity of this method is in part a recognition of the fact that its use comes closer (than other methods) to matching the periodic revenues of the firm with the expense of obtaining those revenues. In other words, the passing of time, which is inherent in the straight line method of depreciation, is not allowed to dominate the depreciation expense determination. Another factor which has contributed to the increased recognition of this method is the gradual build-up of experience in estimating total output of a given machine or piece of equipment. Many enterprises today, for example, have extensive experience tables at hand for estimating the miles a truck will run or how many units of product a given machine will turn out.

The fundamentals of the units of output method are easy to grasp. Suppose, for instance, a machine is acquired costing $5,000 and that it has an estimated productivity of 80,000 units. The depreciation rate would be ($5,000 ÷ 80,000) or 6.25¢ per unit and, if 9,000 units were produced in the first year, the depreciation expense would be (9,000 × 6.25¢) or $562.50. If at the end of the first year the estimate of remaining units to be produced on the machine should be changed to, say, 70,000 units, the accountant would ordinarily simply divide the book value at that date, $5,000 − $562.50 = $4,437.50, by the 70,000 expected units in order to derive a new rate for the second year. Of course, it is also acceptable to adopt the hyphenated account procedure described in Chapter 11 if slightly greater comparability of expense data is desired.

**Depreciation schedule.** When the records pertaining to fixed assets have been badly kept in the past, it may be desirable to prepare a special schedule for the purpose of bringing the accounts into a satisfactory position. This schedule is especially needed in cases of (1) mixed Asset and Reserve for Depreciation accounts, (2) charging of expense items to the Asset account, (3) handling trade-ins in an unsatisfactory manner, and (4) handling major renovations and betterments in an inconsistent fashion.

The following illustrative problem is presented in order to show the recommended form.

***Illustrative Problem***

The following accounts appear on the books of the Road Company. Prepare a depreciation schedule by years if the originally estimated life of each truck was

[8] Stanley, 87 *Journal of Accountancy* 481. An excellent summary of this entire problem is contained in "Effects of Depreciation Policy," *National Industrial Conference Board Studies in Business Economics No. 22* (1950).

5 years with no scrap value. Prepare also the entry to correct the books on December 31, 1952.

**Automobile Trucks**

| | | | |
|---|---|---|---|
| 1/1/46 Truck No. 1 | $1,250 | 12/31/46 Depreciation | $ 401 |
| 7/1/46 Truck No. 2 | 1,500 | 12/31/47 Depreciation | 833 |
| 12/1/46 Tires for Truck No. 1 | 40 | 12/31/48 Depreciation | 1,247 |
| 1/1/47 Truck No. 3 | 1,375 | 12/31/49 Depreciation | 1,570 |
| 1/1/48 Truck No. 4 | 1,800 | 12/31/50 Depreciation | 1,570 |
| 3/1/48 Tires for Truck No. 1 | 25 | 12/31/51 Depreciation | 1,970 |
| 5/1/48 Tires for Truck No. 2 | 110 | 12/31/52 Depreciation | 1,970 |
| 7/1/48 See Footnote *a* | 350 | 12/31/52 Balance | 289 |
| 1/1/49 See Footnote *b* | 1,400 | | |
| 1/1/51 See Footnote *c* | 2,000 | | |
| | $9,850 | | $9,850 |
| 1/1/53 Balance | $289 | | |

*a.* Cost of replacing body on Truck No. 1 destroyed by accident (no insurance or damages received).
*b.* Cash paid for Truck No. 5 replacing Truck No. 2 in addition to allowance of $350 given on old truck.
*c.* Cash paid for Truck No. 6 replacing Truck No. 4 in addition to allowance of $500 given on old truck.

**Earned Surplus**

| | | | |
|---|---|---|---|
| 1949 | $1,000 | 1946 | $3,000 |
| | | 1947 | 4,100 |
| | | 1948 | 2,200 |
| | | 1950 | 1,600 |
| | | 1951 | 4,700 |

**Profit and Loss**

| | |
|---|---|
| 1952 | $2,000 |

*Solution*

**Depreciation Schedule—1946 through 1952**

| Date | Truck No. | Asset Dr.; Cr.* | Correct Depreciation 1946 | 1947 | 1948 | 1949 | 1950 | 1951 | 1952 | Reserve Dr.; Cr.* |
|---|---|---|---|---|---|---|---|---|---|---|
| 1/1/46 | 1 | $ 1,250 | $250 | $250 | $ 250 | $ 250 | $ 250 | ... | ... | $1,250* |
| 7/1/46 | 2 | 1,500 | 150 | 300 | 300 | ... | ... | ... | ... | 750* |
| 1/1/47 | 3 | 1,375 | ... | 275 | 275 | 275 | 275 | $ 275 | ... | 1,375* |
| 1/1/48 | 4 | 1,800 | ... | ... | 360 | 360 | 360 | ... | ... | 1,080* |
| 1/1/49 | 5 | 1,750*a* | ... | ... | ... | 350 | 350 | 350 | $350 | 1,400* |
| 1/1/51 | 6 | 2,500*b* | ... | ... | ... | ... | ... | 500 | 500 | 1,000* |
| Total | | $10,175 | $400 | $825 | $1,185 | $1,235 | $1,235 | $1,125 | $850 | $6,855* |
| Trade-in No. 2 | | $ 1,500* | | | | | | | | $ 750 |
| Trade-in No. 4 | | 1,800* | | | | | | | | 1,080 |
| Total | | $ 3,300* | | | | | | | | $1,830 |
| Correct Balances | | $ 6,875 | | | | | | | | $5,025* |
| On Books | | 289 | | | | | | | | –0– |
| Correction Needed | | $ 6,586 | | | | | | | | $5,025* |

*a.* $1,400 + $350 = $1,750
*b.* $2,000 + $500 = $2,500

**Entry to Correct Books**

| | | |
|---|---|---|
| Automobile Trucks | $6,586 | |
| Earned Surplus | | $ 441 |
| Depreciation Expense ($1,970 − $850) | | 1,120 |
| Reserve for Depreciation | | 5,025 |
| To correct the books; Earned Surplus adjustment computed as follows: | | |
| Loss on Truck No. 2 | $ 400 | |
| Loss on Truck No. 4 | 220 | |
| Repairs | 350 | |
| Tire expense | 175 | |
| Total | $1,145 | |
| Depreciation taken 1946–1951 | $7,591 | |
| Correct depreciation 1946–1951 | 6,005 | 1,586 |
| Correction (credit) | | $ 441 |

## Depreciation and Depletion: Actuarial Science Methods

**Sinking fund, annuity, and compound interest.** All three of these methods compute depreciation on the assumption that the difference between the cost, $C$, and the scrap value, $S$, of the fixed assets will be funded at an interest rate $f$; but they differ in the rate of interest (designated as $i$) applied on the unamortized original value to compute the interest element to be included in the annual depreciation charge. The three methods may be distinguished, therefore, by the valuation placed upon $i$, i.e.,

| | Valuation of $i$ |
|---|---|
| Sinking fund method | Zero |
| Annuity method | $f$ |
| Compound interest method | Any rate other than $f$ or zero |

The names of the three methods are not descriptive, as all three methods involve funds, annuities, and compound interest. The names are, however, in common use and will be adhered to in this text. While these depreciation methods may be used without the actual setting up of the Depreciation Fund account, the mathematics of the fund is involved in all three methods. The similarity between the mathematics for a sinking fund (see pages 231–232) and for a depreciation fund is very close. The depreciation fund and sinking fund formulas for $I$, $AF_t$, and $BF_t$ and the computations for the fund accumulation tables are the same except that $F$ (the face of debt to be retired) is replaced by $(C - S)$. There are, however, two additional depreciation fund formulas, one for "wearing value," and the other for "condition per cent." While the wearing value at date of purchase is $(C - S)$, the wearing value after $t$ periods is:

$$W_t = \frac{(C - S)a_{\overline{n-t}|f}}{a_{\overline{n}|f}}$$

There are two definitions of condition per cent. The first defines condition per cent as the complement of that percentage of the total deprecia-

tion to be taken during the life of the asset which should have been taken at the end of any period (designated by $t$) during the life of the asset, i.e.,

$$CP_t = 1.00 - \frac{BF_t}{C - S}$$

The other definition holds condition per cent to be the ratio in per cent of the remaining wearing value to the original wearing value, i.e.,

$$CP_t = \frac{W_t}{C - S}$$

### *Illustrative Problem*

An asset costing \$10,625, estimated scrap value \$625, interest 6% per period effective, has an estimated service life of 4 periods.

Part 1. Compute the periodic cash installment paid into the depreciation fund.
Part 2. Prepare a depreciation fund accumulation table.
Part 3. Compute the amount added to depreciation fund during the third period.
Part 4. Compute the accumulation in the depreciation fund after the second period.
Part 5. Compute the wearing value after the second period.
Part 6. Compute the condition per cent after the second period.

### *Solution*

PART 1

$$I = (C - S) \div s_{\overline{n}|f} = (\$10{,}625 - \$625) \div s_{\overline{4}|.06} = \$2{,}285.91$$

PART 2

| End of Year | Cash Cr. | Interest Income Cr. | Depreciation Fund Dr. | Depreciation Fund Balance |
|---|---|---|---|---|
| 1 | \$2,285.91 | ..... | \$2,285.91 | \$ 2,285.91 |
| 2 | 2,285.91 | \$137.15 | 2,423.06 | 4,708.97 |
| 3 | 2,285.91 | 282.54 | 2,568.45 | 7,277.42 |
| 4 | 2,285.93 | 436.65 | 2,722.58 | 10,000.00 |

PART 3

$AF_t = I \times (1 + f)^{t-1}$

$AF_3 = \$2{,}285.91 \times (1.06)^2 = \$2{,}568.45$ (agrees with Fund Dr. figure above)

PART 4

$BF_t = I \times s_{\overline{t}|f}$

$BF_2 = \$2{,}285.91 \times s_{\overline{2}|.06} = \$4{,}708.97$ (agrees with Fund Balance figure above)

PART 5

$$W_2 = \frac{(\$10{,}625 - \$625)a_{\overline{2}|.06}}{a_{\overline{4}|.06}} = \$5{,}291.03 \text{ (agrees with } \$10{,}000 - \$4{,}708.97)$$

PART 6

$$CP_2 = 1.00 - \frac{s_{\overline{2}|.06}}{s_{\overline{4}|.06}} = 52.9\%$$

$$CP_2 = \frac{(\$10{,}625 - \$625)a_{\overline{2}|.06}}{a_{\overline{4}|.06}} \div (\$10{,}625 - \$625) = 52.9\%$$

*Journal entries for depreciation expense.* Since the periodic depreciation expense entries may be derived from the depreciation fund table without the use of complicated formulas, the journal entries pertaining to the asset covered by the foregoing funds under all three actuarial science depreciation methods are tabulated below.

### *Illustrative Problem*

Tabulate the depreciation expense entries for an asset costing $10,625, estimated scrap value $625 after a service life of 4 periods, if the depreciation fund earned 6 per cent per period, and if the periodic effective interest rate applied on the unamortized cost value to compute the interest element to be included in the periodic depreciation charge was: Case A, zero per cent; Case B, 6 per cent; Case C, 10 per cent.

*Solution*

| End of Period (1) | Depreciation Expense Dr. (2) | Reserve for Depreciation Cr. (3) | Reserve for Interest on Investment Cr. (4) | Unamortized Asset Balance (5) |
|---|---|---|---|---|
| | | CASE A. SINKING FUND METHOD | | |
| 0 | ..... | ..... | ..... | $10,625.00 |
| 1 | $2,285.91 | $2,285.91 | ..... | 8,339.09 |
| 2 | 2,423.06 | 2,423.06 | ..... | 5,916.03 |
| 3 | 2,568.45 | 2,568.45 | ..... | 3,347.58 |
| 4 | 2,722.58 | 2,722.58 | ..... | 625.00 |
| | | CASE B. ANNUITY METHOD | | |
| 0 | ..... | ..... | ..... | $10,625.00 |
| 1 | $2,923.41 | $2,285.91 | $637.50 | 8,339.09 |
| 2 | 2,923.41 | 2,423.06 | 500.35 | 5,916.03 |
| 3 | 2,923.41 | 2,568.45 | 354.96 | 3,347.58 |
| 4 | 2,923.43 | 2,722.58 | 200.85 | 625.00 |
| | | CASE C. COMPOUND INTEREST METHOD | | |
| 0 | ..... | ..... | ..... | $10,625.00 |
| 1 | $3,348.41 | $2,285.91 | $1,062.50 | 8,339.09 |
| 2 | 3,256.97 | 2,423.06 | 833.91 | 5,916.03 |
| 3 | 3,160.05 | 2,568.45 | 591.60 | 3,347.58 |
| 4 | 3,057.34 | 2,722.58 | 334.76 | 625.00 |

The entries in column (3) are taken from column (4) in the depreciation fund table. The items in column (5) are the previous yearly balances minus

the current entries in column (3). The column (4) figures are the product of the previous balances in column (5) multiplied by the rate $i$ used to compute the interest on investment element. The figures in column (2) are the sums of the current items in columns (3) and (4).

*Annual depreciation charge.* While the annual depreciation expense can be read from the tabulated journal entries prepared as shown above, the annual depreciation allowance for the $t$ th period (designated by $D_t$) may be computed by means of special formulas.

Under Compound Interest Method. The depreciation charge for the $t$ th period under the compound interest method is:

$$D_t = \frac{(C - S)(1+f)^{t-1}}{s_{\overline{n}|f}} + \left\{ i\left[ C - \frac{(C - S)s_{\overline{t-1}|f}}{s_{\overline{n}|f}} \right] \right\}$$

In the foregoing problem, the equation for the third period is:

$$D_3 = \frac{(\$10{,}625 - \$625)(1.06)^2}{s_{\overline{4}|.06}} + \left\{ .10\left[ \$10{,}625 - \frac{(\$10{,}625 - \$625)s_{\overline{2}|.06}}{s_{\overline{4}|.06}} \right] \right\}$$
$$= \$3{,}160.0509$$

which agrees with the item in column (2) in the above table.

Under Annuity Method. The depreciation charge for the $t$ th payment under the annuity method may be calculated by either of the following:

FORMULA NO. 1

$$D_t = \frac{C - S(1+f)^{-n}}{a_{\overline{n}|f}}$$

FORMULA NO. 2

$$D_t = \frac{C(1+f)^n - S}{s_{\overline{n}|f}}$$

In the foregoing problem, the equation for the third period (using Formula No. 1) is:

$$D_3 = \frac{\$10{,}625 - [\$625 \times (1.06)^{-4}]}{a_{\overline{4}|.06}} = \$2{,}923.4149$$

which agrees with the item in column (2) in the above table.

Under Sinking Fund Method. The depreciation charge for the $t$ th payment under the sinking fund method is:

$$D_t = \frac{(C - S)(1+f)^{t-1}}{s_{\overline{n}|f}}$$

In the foregoing problem, the equation for the third period is:

$$D_3 = \frac{(\$10{,}625 - \$625)(1.06)^2}{s_{\overline{4}|.06}} = \$2{,}568.4484$$

which agrees with the third item in column (2) in the above table.

**Constant percentage on diminishing base method of computing depreciation.** The mathematics of this depreciation method is given in the annotated solution to the following illustrative problem.

*Illustrative Problem*

An asset costing $10,000, scrap value $1,073.74 after 10 periods, is to be depreciated by the constant percentage of book value method.

Part 1. Compute the depreciation rate (designated by $r$).

Part 2. Prepare a depreciation table.

Part 3. Compute the depreciation expense for the fifth period.

Part 4. Compute the balance in the depreciation reserve at the end of the fifth period.

Part 5. Compute the book value of the asset at end of fifth period.

Part 6. Compute the condition per cent at the end of the fourth period.

*Annotated Solution*

PART 1

$$r = 1 - \sqrt[n]{\frac{S}{C}} = 1 - \sqrt[10]{\frac{1{,}073.74}{10{,}000.00}} = 0.2$$

The tenth root of .107374, which normally is solved by use of logarithms, is 0.8; this may be readily checked, for $(0.8)^{10} = .1073741824$.

PART 2

| End of Period | Depreciation Expense Dr. | Reserve for Depreciation Cr. | Unamortized Book Value |
|---|---|---|---|
| 0 | ..... | ..... | $10,000.00 |
| 1 | $2,000.00 | $2,000.00 | 8,000.00 |
| 2 | 1,600.00 | 1,600.00 | 6,400.00 |
| 3 | 1,280.00 | 1,280.00 | 5,120.00 |
| 4 | 1,024.00 | 1,024.00 | 4,096.00 |
| 5 | 819.20 | 819.20 | 3,276.80 |
| 6 | 655.36 | 655.36 | 2,621.44 |
| 7 | 524.29 | 524.29 | 2,097.15 |
| 8 | 419.43 | 419.43 | 1,677.72 |
| 9 | 335.54 | 335.54 | 1,342.18 |
| 10 | 268.44 | 268.44 | 1,073.74 |

PART 3

$D_t = Cr(1 - r)^{t-1}$

$D_5 = \$10{,}000 \times .2 \times (1 - .2)^4 = \$819.20$, which agrees with fifth figure in Reserve column

PART 4

$R_t = C[1 - (1 - r)^t]$

$R_5 = \$10{,}000 \times [1 - (1 - .2)^5] = \$6{,}723.20$, which agrees with sum of first 5 figures in Reserve column

PART 5

$BV_t = C(1 - r)^t$

$BV_5 = \$10{,}000 \times (1 - .2)^5 = \$3{,}276.80$, which agrees with Unamortized Book Value figure for end of fifth period

PART 6

$$CP_t = 100 - \frac{C[1 - (1 - r)^t]}{C - S}$$

$$CP_4 = 100 - \frac{\$10{,}000 \times [1 - (1 - .2)^4]}{\$10{,}000 - \$1{,}073.74} = 33.86\%$$

**Depletion under Hoskold formula.** A memorandum prepared by Metals Valuation Section, Income Tax Bureau, valued a metal mine by using the Hoskold formula with 15 per cent as the speculative rate and 4 per cent as the sinking fund rate and then computed future depletion on a constant charge per ton.[9] This commonly used unit of product method of computing depletion is not mathematically consistent with the premises of the Hoskold method of valuing the wasting asset. For example, assume that a mineral deposit contains 100,000 tons of ore and that 10,000 tons may be extracted and sold annually to yield $3.00 a ton before providing for depletion. The value of the deposit under the Hoskold formula, speculative rate 12 per cent and sinking fund rate 4 per cent, is as follows:

$$V = \frac{\$30{,}000}{\frac{1}{s_{\overline{10}|.04}} + .12} = \$147{,}571.78$$

Using the procedure on page 222, the tabulated entries of the investor and his depletion cost per ton (column (6) divided by 10,000) are as follows:

| End of Year (1) | Cash Dr. (2) | Income Cr. (3) | Investments | | | | Depletion Cost Per Ton (8) |
|---|---|---|---|---|---|---|---|
| | | | Funded Dr. (4) | Funded Balance (5) | Unfunded Cr. (6) | Unfunded Balance (7) | |
| 0 | ..... | ..... | ..... | ..... | ..... | $147,571.78 | .... |
| 1 | $17,708.61 | $17,708.61 | $12,291.39 | $ 12,291.39 | $12,291.39 | 135,280.39 | $1.23 |
| 2 | 17,708.61 | 17,708.61 | 12,291.39 | 25,074.44 | 12,783.05 | 122,497.34 | 1.28 |
| 2 | ..... | ..... | 491.66 | ..... | ..... | ..... | .... |
| 3 | 17,708.61 | 17,708.61 | 12,291.39 | 38,368.81 | 13,294.37 | 109,202.97 | 1.33 |
| 3 | ..... | ..... | 1,002.98 | ..... | ..... | ..... | .... |
| 4 | 17,708.61 | 17,708.61 | 12,291.39 | 52,194.95 | 13,826.14 | 95,376.83 | 1.38 |
| 4 | ..... | ..... | 1,534.75 | ..... | ..... | ..... | .... |
| 5 | 17,708.61 | 17,708.61 | 12,291.39 | 66,574.14 | 14,379.19 | 80,997.64 | 1.44 |
| 5 | ..... | ..... | 2,087.80 | ..... | ..... | ..... | .... |
| 6 | 17,708.61 | 17,708.61 | 12,291.39 | 81,528.50 | 14,954.36 | 66,043.28 | 1.50 |
| 6 | ..... | ..... | 2,662.97 | ..... | ..... | ..... | .... |
| 7 | 17,708.61 | 17,708.61 | 12,291.39 | 97,081.03 | 15,552.53 | 50,490.75 | 1.56 |
| 7 | ..... | ..... | 3,261.14 | ..... | ..... | ..... | .... |
| 8 | 17,708.61 | 17,708.61 | 12,291.39 | 113,255.66 | 16,174.63 | 34,316.12 | 1.62 |
| 8 | ..... | ..... | 3,883.24 | ..... | ..... | ..... | .... |
| 9 | 17,708.61 | 17,708.61 | 12,291.39 | 130,077.28 | 16,821.62 | 17,494.50 | 1.68 |
| 9 | ..... | ..... | 4,530.23 | ..... | ..... | ..... | .... |
| 10 | 17,708.61 | 17,708.61 | 12,291.39 | 147,571.78 | 17,494.50 | ..... | 1.75 |
| 10 | ..... | ..... | 5,203.11 | ..... | ..... | ..... | .... |

The above table shows that the Hoskold method assumes that the sinking fund method of computing depreciation shall be used for depletion to

[9] Quoted in (1923) Saliers 466.

secure a unit cost for depletion which increases from $1.23 to $1.75 per ton while the commonly used straight line method sets the unit cost for depletion at $1.48 a ton.

**Depreciation under the group system.** During recent years a number of firms have adopted a procedure for determining the amount of the periodic depreciation charge which is called "the group system." This system may be contrasted (1) with the "unit plan" under which depreciation is determined separately for each item of fixed asset and (2) with the "composite plan" under which depreciation is determined for an entire plant building (or the contents of a building). Instead of following either of the preceding techniques the group system [10] involves the following steps:

1. Properties of like nature are grouped for recording purposes.
2. Depreciation is calculated on the group rather than upon the items making up the group.
3. A rate of depreciation is derived by:

(a) Finding a weighted average of the useful life of the specific assets included in the group.

(b) The net amount to be depreciated (e.g., cost less estimated scrap value, if the assets have not been appraised subsequent to their acquisition or if this appraisal has not been recorded) is divided by useful life estimate made in (a). This is one way of deriving a figure in dollars which represents the periodic expense for depreciation.

(c) The third substep is to take the amount determined in (b) and divide it by the total cost (or other recorded amount) in order to derive a depreciation rate expressed in per cent of the gross booked amount.

4. After the depreciation rate has been derived in (c) above it is periodically multiplied by the gross booked amount of the similar fixed asset units making up the group. This step is usually carried out at each closing date, and it gives, of course, the periodic depreciation expense.
5. At the time an asset item in the group is disposed of (either by sale or scrapping) the recorded gross asset amount (adjusted for scrap or trade-in recovery) is debited to the Reserve for Depreciation account and credited to the Fixed Asset account for the group. Unless the retirement or disposal is extraordinary, say by fire, no gain or loss is reported at the time of the disposal — such recognition is delayed until all the items in the group are retired.

In order to show the details of the group system, the exhibit [11] on page 308 is presented. In this exhibit it is assumed that the business unit has three classes of gasoline pumps, the most important distinction between the

[10] Lanham, 22 *Accounting Review* 171.
[11] Carroll, 23 *N.A.C.A. Bulletin* 480 (quoted by permission).

EXHIBIT

## GROUP PLANT RECORD

### Pumps and Pumping Equipment

| | Investment in Fixed Asset Account | | | | | Group Depreciation Reserve | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Additions | | | Deductions | | | | |
| Date | Balance | Additions | Deductions | Rates | Annual Depreciation | Balance at Beginning of Period | Current Provision | Salvage on Retirements | Retirements | Dismantling Cost | Other | Balance at End of Period | Direct Profit (Loss) Items |
| 8-1 | $ 36,500.00 | ..... | ..... | 6.20% | $ 2,263.00 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 8-1 | 58,200.00 | ..... | ..... | 5.75 | 3,346.50 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 8-1 | 72,300.00 | ..... | ..... | 8.40 | 6,073.20 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | $167,000.00 | ..... | ..... | 7.00 | $11,682.70 | $71,657.00 | $973.56 | ..... | ..... | ..... | ..... | ..... | ..... |
| 8-16 | ..... | $18,450.00 | ..... | 5.75 | 1,060.88 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 8-16 | ..... | ..... | $10,100.00 | 6.20 | (626.20) | ..... | ..... | $310.00 | $10,100.00 | $150.00 | ..... | ..... | ..... |
| 8-17 | ..... | ..... | 25,000.00 | 8.40 | (2,100.00) | ..... | ..... | ..... | 17,870.00 | ..... | ..... | ..... | $(7,491.00)* |
| 8-31 | ..... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | $44,820.56 | ..... |
| 9-1 | $150,350.00 | ..... | ..... | 6.66 | $10,017.38 | 44,820.56 | 834.78 | ..... | ..... | ..... | ..... | ..... | ..... |

* Extraordinary retirement due to fire:

| | |
|---|---|
| Net Book Value | $7,130.00 |
| Removal Cost | 1,251.00 |
| Total | $8,381.00 |
| Salvage | 890.00 |
| Loss | $7,491.00 |

classes being the fact that they have different service lives. A weighted average rate is derived by calculating the yearly depreciation for the individual classes and adding to derive a group total. As explained above, the per cent of the preceding total to the total cost of the fixed asset group constitutes the weighted average depreciation rate (expressed as a per cent). As explained by one authority:

> The August Provision of $973.56 is entered under the group depreciation reserve analysis. Note that the provision for each month is computed on the opening balance of the investment so that the book entry for the provision may be made as early in the month as desired. The additional investment of $18,450 in the 5.75 per cent rate class is entered in the additions column of the investment section. The retirement of $10,100 is also set up under the investment section. Note that the full cost of $10,100 is charged to the reserve along with the removal cost. Salvage recovered is credited to the reserve as previously described. The $25,000 retirement is assumed to be extraordinary, in which case the amount of accumulated depreciation only is charged back to the reserve. Effect is given to salvage and removal cost in the computation of the loss of $7,491. Note how the annual provision column is adjusted for the changes in investment so that the balance at September 1 can be divided by 12 to get the September provision.[12]

If the group system is adopted, the depreciation rates must be kept under constant surveillance in order to prevent the group reserves for depreciation from getting too large or too small in relation to the fixed asset accounts. The determination as to whether the group reserves are out of line is fraught with difficulty; it requires continuous study of the service lives of the fixed asset additions as well as the amount and timing of the disposals of the items included in each group. Various statistical studies [13] made by investigators will be of some help in this matter, but there is no substitute for the experience developed within each firm.

*Advantages claimed for the group system.* The advantages of the group system of depreciation may be summarized as follows:

1. Since an averaging technique is used, there should be less total error in the depreciation charge for each period; that is, the asset items underdepreciated will be to some extent offset by the items on which too much depreciation is taken.

2. The group plan allows for the taking into consideration of the circumstances affecting depreciation on similar units of property located in different operating or climatic areas. For example, similar trucks may be operated in some instances in rough, dusty territory as well as on paved roads. The group life on trucks in this case can be varied to suit the conditions existing in the two situations.

[12] *Ibid.*, pp. 479, 481 (quoted by permission).

[13] Kurtz, E. B., *The Science of Valuation and Depreciation* (New York: Ronald Press Co., 1937); Winfrey, R., *Iowa Engineering Experiment Station Bulletins Nos. 155, 156*, published in 1942.

3. Bookkeeping routine is reduced materially under the group system as compared with the asset unit system. This may represent a large saving in the expense of recording the asset and depreciation transactions.

4. Under the group system the amount of loss and gain on asset disposition is ordinarily reduced materially. This has the supposed advantage of matching more closely the periodic revenue and expense of the individual firm.

5. The forecasting of the expense item for depreciation is made easier since the number and variety of calculations are both smaller in quantity than under the asset unit system. Estimates of the specific retirement date of individual asset units are also unnecessary.

6. The group system offers much more flexibility than either the composite life system or the asset unit plan, since there are many separate possibilities for grouping the assets; yet the assumption is not made that the entire plant as a unit will become exhausted over a certain number of years, which is inherent in the composite life system.

**Returnable containers.** Many business firms follow the practice of shipping their products to customers in containers which are returnable. Several different plans are used to carry out the details of the accounting; income tax requirements are also to be considered in the decision as to the plan of record keeping to be employed.

*No deposit for and no sale of the container.* This type of situation presents very little accounting difficulty other than the determination of the depreciation on the containers each reporting period. When the containers are purchased they are charged to a fixed asset account. Subsequently, at the end of each period an estimated depreciation sum is determined, based on the following factors: (1) extent to which the containers have been kept in good repair by maintenance and reconditioning expenditures; (2) extent to which empty containers have been protected from careless loss and theft; (3) extent to which the containers have been protected from careless handling which causes breakage and reduction in the number of times the container will make a round trip; (4) deteriorating action of the contents of the container, e.g., acids. The depreciation charge should be large enough to cover all the observed and hidden shrinkage in the inventory of containers as well as predictable obsolescence. Any loss due to sudden obsolescence, however, should be reported as a loss.[14]

*Container sold to customer with promise to repurchase.* In this type of situation the legal title to the container is not definitely kept by the seller of the product; the latter only agrees to take back the drum, box, etc., if it is in usable condition. The price used in the transaction may be approximately the cost of the container, or it may be a figure considerably in

[14] *Regulations 111*, Section 29.22(c)–2; *Buckeye Producing Co.*, 15 B.T.A. 435.

excess of cost. The essential elements of this type of situation can be accounted for as follows:

a. The price of the container is to be included in sales whether or not the container is shown separately in the billing;
b. the "redemption" or "repurchase" price of the container is to be treated just as any other container purchase;
c. the containers on hand (but not those in the hands of customers) at the close of the accounting period (fiscal period, fiscal year, or calendar year) are to be inventoried at "cost or market, whichever is lower" (if that is taxpayer's inventory basis); but
d. no "reserve for redemption of containers" and no reserve to offset the "container accounts receivable" will be recognized, nor will any addition to such a reserve be allowed as a deduction for tax purposes;
e. there is no segregation of receivables for container sales necessary and collections on account of containers are to be matched up (keyed) with charges for containers.[15]

*Handling containers sent out on deposit.* In this type of situation the legal title to the container is specifically kept by the seller of the product. The seller, however, usually sends an invoice to the vendee for the cost (or some higher price) of the returnable container covering the deposit; this deposit is returned by the seller of the product if the container is sent back in reusable condition. The essential elements of this type of situation can be accounted for as follows:

a. The container price must be separately shown in the billing and it would be beneficial if a separate column or account could be kept for such items "out on memorandum billing," and much more beneficial if not reflected in the general ledger;
b. any payment received shall be considered a liability just as any other deposit by a customer is a liability;
c. upon return of the container the container account receivable shall be credited;
d. containers shall not be considered an inventory item, but shall be capitalized and depreciated over their probable useful life;
e. the container account (fixed asset account) shall show the cost of all containers, whether in the hands of customers or on hand, until completely recovered through depreciation;
f. no "reserve for redemption" is needed, because the memorandum billing to customers is automatically offset by the account "containers in hands of customers" if the general ledger shows these items — if not, there is no asset to be offset;
g. the rulings and federal court decisions show that taxpayer is required, under such plan (taxpayer retains title), to return as income the percentage of the billings (billed containers) which his or its experience dictates will not be returned for credit (the higher the deposit required and the greater the disparity between cost and billing price, the greater the chance of the return of the container); and

[15] Butscher, 81 *Journal of Accountancy* 134 (quoted by permission).

h. . . . deposits (collections) for containers . . . are not to be merged, commingled, or too definitely matched up with container accounts receivable because (a) the difference between deposits received and deposits repaid must prove with the "deposits received for containers" control account in the general ledger, and (b) the container accounts receivable total must show the open billings for containers to be returned and this figure should agree with the balance in the control account "containers in hands of customers" in the memorandum ledger.[16]

The flow of entries for this case is illustrated below:

1. To record shipments sent out on memorandum billing:

| | | |
|---|---|---|
| Accounts Receivable — Containers | $... | |
| Containers with Customers (Bailees) | | $... |

2. To record return of containers from customers:

| | | |
|---|---|---|
| Containers with Customers (Bailees) | $... | |
| Accounts Receivable — Containers | | $... |

NOTE. The two preceding entries may be handled on a memorandum basis, in which case they would not be reflected on the financial statements. If, on the other hand, they are recorded on the general ledger, the Containers with Customers account is shown as an offset to the Receivable account on the balance sheet.

3. To record the purchase of the containers:

| | | |
|---|---|---|
| Returnable Containers | $... | |
| Cash | | $... |

4. To record the deposits from customers:

| | | |
|---|---|---|
| Cash | $... | |
| Deposits Received for Containers | | $... |

5. To record return of customer deposits:

| | | |
|---|---|---|
| Deposits Received for Containers | $... | |
| Cash | | $... |

6. To record depreciation on containers:

| | | |
|---|---|---|
| Depreciation Expense — Containers | $... | |
| Reserve for Depreciation — Returnable Containers | | $... |

7. To record revenue realized from deposits which will not be returned:

| | | |
|---|---|---|
| Deposits Received for Containers | $... | |
| Sales of Containers | | $... |

The detail subsidiary records required to keep track of the deposits from each customer may occasion much clerical effort if there are thousands of containers out in the hands of hundreds of customers.[17] One rather simple form of individual customer ledger sheet is as follows:

[16] Butscher, 81 *Journal of Accountancy* 134–135 (quoted by permission).
[17] An effective method of handling this problem is given in Taylor, 25 *N.A.C.A. Bulletin* 1178–1194.

| Date | Reference | Explanation | Serial No. | 150-lb. can | 300-lb. can | Deposit for Container | Accounts Receivable Containers |
|---|---|---|---|---|---|---|---|
| 9/30/50 | Sales Book | Shipped | P66 | 1 | .. | ... | $12 |
| 10/2/51 | Sales Book | Shipped | S88 | .. | 1 | ... | 24 |
| 10/26/51 | Cash Book | Deposit received | ... | .. | .. | $36 | ... |
| 11/15/51 | Cr. Memo No. 444 | Can returned | S88 | .. | 1 | ... | 24* |
| 11/30/51 | Check No. 682 | Deposit repaid | ... | .. | .. | 24* | ... |
| 12/31/51 | | Balances | ... | .. | .. | $12 | $12 |

* Indicates red figure.

Of course, the expenditures for cleaning and repairing the containers in this case are charged off as a current expense, assuming that the customers do not have to pay for such repairs. The determination of the amount of periodic depreciation is governed by the same factors which have been noted in a previous paragraph of this section.

In order to encourage customers to return the container and get their money refunded some firms submit at periodic intervals statements to the vendees showing information such as the following:

1. Invoice dates
2. Invoice numbers
3. Container serial numbers
4. Product class or type
5. Sizes of containers held by customer
6. Deposit on each container
7. Total deposits
8. Total number of containers held by customer

## Leases

**Leases as annuities.** Leases should be broken up into as many annuities as there are different stipulated rents; i.e., a lease calling for $100 a month for ten years, and then $125 a month for the next fifteen years really represents, if the payments are made at the start of each month, (1) an annuity due of $100 a month for ten years, and (2) an annuity due of $125 a month for fifteen years, deferred ten years. Since leases ordinarily involve annuities due and deferred annuities due, problems involving leases should be solved by first converting the interest rate to an effective rate per payment period and then by utilizing the formulas for an annuity due or a deferred annuity due.

**Lump sum payments in lieu of rent.** When the lessee and the lessor agree on a rate to be used in determining the lump sum equivalent of the rents

(payable in advance) stipulated in the lease, the lump sum ($L$) is equal to the present worth of an annuity due of the first stipulated rental ($S_1$) for its duration ($t_1$) plus the present worth of an annuity due of the second stipulated rental ($S_2$) for its duration ($t_2$), deferred for $t_1$ payment periods, interest $r$ per cent per payment period effective. Using the mathematical symbols, the formula is:

$$L = [S_1 \times a_{\overline{t_1}|r} \times (1 + r)] + [S_2 \times a_{\overline{t_2}|r} \times (1 + r) \times (1 + r)^{-t_1}]$$

If the payments were made at the end of the payment periods, the annuities would be ordinary annuities instead of annuities due and the factors $(1 + r)$ should be omitted from the formula.

*Illustrative Problem*

Find the lump sum payment which is the equivalent to the annual rental payments made at the start of each year under a lease calling for $1,000 annually for 2 years with a renewal clause (assumed to be exercised) extending the lease 3 years at an annual rental of $1,200, interest 6 per cent per annum effective.

*Solution*

$$L = [\$1{,}000 \times a_{\overline{2}|.06} \times 1.06] + [\$1{,}200 \times a_{\overline{3}|.06} \times 1.06 \times (1.06)^{-2}] = \$4{,}969.45$$

**Proof of Accuracy and Entries of Lessor and Lessee**

| Start of Year | Rent Income Cr. | Interest Expense Dr. | Prepaid Rent Dr. | Prepaid Rent Balance | Lessor's Entries |
|---|---|---|---|---|---|
| Start of Year | Rent Expense Dr. | Interest Income Cr. | Prepaid Rent Cr. | Prepaid Rent Balance | Lessee's Entries |
| 0 | ..... | ..... | ..... | $4,969.45 | |
| 1 | $1,000.00 | ..... | $1,000.00 | 3,969.45 | |
| 2 | 1,000.00 *a* | $238.17 *b* | 761.83 *c* | 3,207.62 *d* | |
| 3 | 1,200.00 | 192.46 | 1,007.54 | 2,200.08 | |
| 4 | 1,200.00 | 132.00 | 1,068.00 | 1,132.08 | |
| 5 | 1,200.00 | 67.92 | 1,132.08 | ..... | |

*a*. Stipulated rent.
*b*. Previous prepaid rent balance times $r$.
*c*. $1,000 − $238.17 = $761.83.
*d*. $3,969.45 − $761.83 = $3,207.62.

**Valuation of leases.** A lease constitutes an asset if the rental that the property would bring on the current market ($M$) exceeds the stipulated rental ($S$) and a liability if the stipulated rental exceeds the current market rental. Normally leases are recorded only if they are purchased, but they should be appraised if the valuation is important; e.g., long leases at high rentals caused the bankruptcy of several large chain stores in 1931 and 1932. The valuation of leases involves breaking up the rental payments into as many annuities as there are different results found by subtracting

the stipulated rental from the current market rental. The interest rate must be expressed in terms of an effective rate per payment interval. If the rentals are payable in advance, they constitute an annuity due. Using the symbols employed above ($V$ designates valuation of lease), the formula is:

$$V = [(M_1 - S_1) \times a_{\overline{t_1}|r} \times (1 + r)] + [(M_2 - S_2) \times a_{\overline{t_2}|r} \times (1 + r) \times (1 + r)^{-t_1}]$$

If the payments are made at the end of the payment periods, both factors $(1 + r)$ should be omitted.

*Illustrative Problem*

Compute the value of a lease, payments made at the start of each year, interest 6 per cent per annum effective, if the original lease ran 2 years with a market rental of \$3,000 and a stipulated rental of \$2,000, and if the exercised renewal clause ran 3 years with a market rental of \$3,500 and a stipulated rental of \$2,300.

*Solution*

$$V = [(\$3{,}000 - \$2{,}000) \times a_{\overline{2}|.06} \times 1.06] + [(\$3{,}500 - \$2{,}300) \times a_{\overline{3}|.06} \times 1.06 \times (1.06)^{-2}] = \$4{,}969.45$$

**Proof of Accuracy and Sub-lessee's Entries for Purchased Lease**

| Start of Year | Rent Expense Dr. | Cash Cr. | Interest Income Cr. | Prepaid Rent Cr. | Prepaid Rent Balance |
|---|---|---|---|---|---|
| 0 | ..... | ..... | ..... | ..... | \$4,969.45 |
| 1 | \$3,000.00 | \$2,000.00 | ..... | \$1,000.00 | 3,969.45 |
| 2 | 3,000.00 | 2,000.00 | \$238.17 | 761.83 | 3,207.62 |
| 3 | 3,500.00 | 2,300.00 | 192.46 | 1,007.54 | 2,200.08 |
| 4 | 3,500.00 | 2,300.00 | 132.00 | 1,068.00 | 1,132.08 |
| 5 | 3,500.00 | 2,300.00 | 67.92 | 1,132.08 | ..... |

This amortization table and the one above for lump sum paid for lease follow the same general principles as the schedule amortizing a purchased annuity on page 240. Both lease tables are illustrations of the use of the annuity method of computing depreciation when there is no scrap value and the amortizations are made at the start of the period.

**Periodic rent when lessee makes improvements.**[18] When the lessee makes an improvement on the leased property at the start of the term of the lease, the equivalent total annual rental (called "sitting" rent in England) is the stipulated rent plus the amortization installment payment for the cost of the improvement.

*Illustrative Problem*

What is the "sitting" rent per annum, if the stipulated rent is \$120 per annum and if the improvement made at the start of the lease cost the lessee \$250? Interest is 5% per annum and the term of the lease is 21 years.

[18] Skrimshire, S., *Valuations* (London: E. and F. N. Spon, Ltd., 1915), p. 151.

*Solution*

| | |
|---|---|
| Stipulated rent per annum | $120.00 |
| Amortization of improvement: | |
| $250 ÷ $a_{\overline{21}|.05}$ | 19.50 |
| "Sitting" rent per annum | $139.50 |

**Premium for lease renewal.**[19] If the lessee wishes to surrender an existing lease and obtain a new one for a longer life, he should pay a premium equal to the present worth of an annuity having a periodic payment equal to the excess of the market rental per period over the stipulated rental per period and a term equal to the excess of the new lease's term over the unexpired term on the old lease, deferred for the life of the existing lease.

***Illustrative Problem***

Property has an annual stipulated rental of $100 and an annual market rental of $150. How much premium should a lessee pay if he surrenders a 14-year lease and obtains a new 40-year lease, interest 5% per annum?

*Solution*

$$P = \$50 \times a_{\overline{26}|.05} \times (1.05)^{-14} = \$363.02$$

**Presentation of long-term leases on financial statements.** Traditionally, accountants have not taken cognizance of long-term leases on the balance sheet, unless (1) a prepayment is involved or (2) the lease amount accrues from period to period and is not paid at the end of a relatively short interval, say one month, or (3) the lessee constructs or makes improvements to the property. Specifically, no balance sheet recognition has generally been made of the rental features of a contract such as the following: The RC Corporation signs an agreement with the XYZ Institute to pay the Institute $1,000 at the end of each calendar month for a period of 40 years for use of a plant building; the Corporation also agrees to pay the taxes, insurance, and repairs on the property as well as to make certain interior improvements which revert to the lessor at the expiration of the lease.

In the type of agreement just noted, the lessee would, of course, record the improvements as assets and depreciate them over their useful lives (not to exceed the term of the lease). The taxes, insurance, and repairs would also be recorded as expenses as they arise. A rather puzzling accounting problem arises, however, as to the balance sheet treatment of the $480,000 due to be paid over the term of the lease. Some alternatives[20] are: (1) Set up the entire $480,000 as an asset with a corresponding liability; each time a monthly payment is recorded a corresponding entry

[19] *Ibid.*, p. 160.
[20] Cannon, 85 *Journal of Accountancy* 319.

would be made reversing a portion of the original $480,000. (2) Set up the present worth of the future rentals both as an asset and a liability, reversing a portion each month as mentioned in (1) above (see illustration in next subsection). (3) List the asset and liability of $480,000 (or some smaller discounted sum) on the face of the balance sheet without extending either item into the money columns. (4) Briefly mention in a footnote the fact that such lease contracts have been entered into by the business firm. (5) Describe at length in a footnote the specific terms (and dollar amounts) of the lease agreements.

The Committee on Accounting Procedure of the American Institute of Accountants has studied this matter at length and recommends alternative (5) above in the following words: [21]

* * * *

3. It has not been the usual practice for companies renting property to disclose in financial statements either the existence of leases or the annual rentals thereunder.* One of the effects of the long-term lease as a substitute for ownership and mortgage borrowing is that neither the asset nor any indebtedness in connection with it is shown on the balance sheet. This has raised the question of disclosure in financial statements of the fixed amounts payable annually thereunder.

4. Although the types of sell-and-lease arrangements referred to in paragraph 1 differ in many respects from the conventional long-term lease,† the principles of disclosure stated herein are intended to apply to both. This bulletin does not apply to short-term leases, or to those customarily used for oil and gas properties.

5. The committee believes that material amounts of fixed rentals and other liabilities maturing in future years under long-term leases and possible related contingencies are material facts affecting judgments based on the financial statements of a corporation; and that those who rely upon financial statements are entitled to know of the existence of such leases and the extent of the obligations thereunder, irrespective of whether the leases are considered to be advantageous or otherwise. Accordingly, where the rentals or other obligations under long-term leases are material in the circumstances, the committee is of the opinion that:

(a) disclosure should be made in financial statements or in notes thereto of
  (1) the amounts of annual rentals to be paid under such leases with some indication of the periods for which they are payable, and
  (2) any other important obligation assumed or guarantee made in connection therewith;
(b) the above information should be given not only in the year in which the transaction originates but also as long thereafter as the amounts involved are material; and

[21] *Accounting Research Bulletin No. 38* (quoted by permission).

* The Securities and Exchange Commission, however, in Note 5 to Rule 12-16 of Regulation S-X dealing with supplementary profit and loss information, requires disclosure in a schedule, if significant in amount, of ". . . the aggregate annual amount of the rentals upon all real property now leased to the person and its subsidiaries for terms expiring more than three years after the date of filing, and the number of such leases," and the minimum annual amount if the rentals are conditional.

† The conventional lease, a straight tenure contract between the owner of property and a lessee, generally does not involve buying, building and selling of property by the lessee, or special repurchase arrangements.

(c) in addition, in the year in which the transaction originates, there should be disclosure of the principal details of any important sale-and-lease transaction.

*Disclosure of the present worth of the future rentals due.* In order to make the balance sheet more informative, the lessee may desire to record an asset, Right to Use Leased Property, and a liability, Present Value of Leasehold Obligations, both accounts being established for the present worth of future rentals.[22] At the end of each period, the liability should be debited and the asset credited for the amount that would be credited to the Reserve for Depreciation if the asset were amortized according to the sinking fund method of computing depreciation (no scrap value assumed). This procedure gives the same final results as though the plant were purchased by issuing an amortization-plan bond issue and the plant were amortized according to the sinking fund method, when the interest rates on the depreciation fund, bond principal, and bond redemption payments are identical.

### *Illustrative Problem*

Tabulate the entries of the owner or lessee of a plant costing $10,000, service life 4 years, no scrap value, all interest rates 6% per annum, if:

Case A. Plant is erected by owner with money raised by issuing a 4-year amortization-plan bond issue and is depreciated according to the sinking fund method.

Case B. Plant is rented on a 4-year lease calling for $2,885.91 at the end of each year.

### *Annotated Solution*

| End of Year | Plant | | Bonds Payable | | Interest Expense | Depreciation Expense | Cash | Case A Owner's Entries |
|---|---|---|---|---|---|---|---|---|
| | Cr. | End of Year Balance (Dr.) | Dr. | End of Year Balance (Cr.) | Dr. | Dr. | Cr. | |
| End of Year | Right to Use Leased Plant | | Present Value of Leasehold Obligation | | Leasehold Expense | | | Case B Lessee's Entries |
| | Cr. | End of Year Balance (Dr.) | Dr. | End of Year Balance (Cr.) | Interest Element Dr. | Depreciation Element (Dr.) | Cash Cr. | |
| 0 | ..... | $10,000.00*a* | ..... | $10,000.00 | ..... | ..... | ..... | |
| 1 | $2,285.91*b* | 7,714.09 | $2,285.91*b* | 7,714.09 | $600.00*c* | $2,285.91*b* | $2,885.91 | |
| 2 | 2,423.06 | 5,291.03 | 2,423.06 | 5,291.03 | 462.85 | 2,423.06 | 2,885.91 | |
| 3 | 2,568.45 | 2,722.58 | 2,568.45 | 2,722.58 | 317.46 | 2,568.45 | 2,885.91 | |
| 4 | 2,722.58 | ..... | 2,722.58 | ..... | 163.33 | 2,722.58 | 2,885.91 | |

*a*. $2,885.91 × $a\overline{4}|.06$ = $10,000.
*b*. Agrees with debit to Depreciation Fund — see page 302.
*c*. Agrees with debit to Expense in debtor's table for amortization of interest-bearing debt — see page 237; also 6% of End of Year Balance in this table.

*Disclosure of long-term leases on the balance sheet.* The Research Department of the American Institute of Accountants [23] has prepared the following data on long-term leases:

[22] Myers, 23 *Accounting Review* 288–295; Cannon, 88 *Journal of Accountancy* 8.
[23] *Accounting Techniques Used in Published Corporate Annual Reports, 1949*, p. 57 (quoted by permission).

Sixteen reports for 1948 were noted in which there were references to the use of long-term leases. Seven of these were in the reports of companies in the retail field. In this retail group, three companies leased properties from subsidiaries (Allied Stores Corp.; W. T. Grant Co.; Safeway Stores, Inc.)

Disclosures of sale-and-lease arrangements were about evenly distributed between the footnotes and the president's letter.

Four footnote disclosures are illustrated below. (See also W. T. Grant Co.; Safeway Stores, Inc.; Canada Dry Ginger Ale, Inc.; Wieboldt Stores, Inc.)

(1) "On March 1, 1948, the Company sold the Koppers Building in Pittsburg, Pa., to the Equitable Life Assurance Society of the United States for $6,000,000 and took back a net lease for a thirty-year term with options to renew the lease for four additional ten-year periods. The profit of $2,260,913 on the sale was credited to earned surplus. The first year's net rental under the lease is $375,000 and each succeeding year's net rental for the initial thirty-year term is $3,750 less than the last preceding year. The net rental for the first renewal period is $150,000 per annum and for each additional renewal period is $120,000 per annum. In addition, the Company is to pay taxes, insurance, repairs, maintenance, and alterations. At the expiration of the twentieth lease year, the Company has the option of terminating the lease by making an offer, which the lessor is free to reject, to purchase the leased property at a price of $3,000,000." (Koppers Co. Inc. — note is keyed to reference thereto on the balance sheet).

(2) "In connection with a sale during the year of a bakery property and prior sales of two similar properties, the company has leased the properties from the purchasers under twenty-year leases at net rentals aggregating $582,000.00 per annum." (Sunshine Biscuits, Inc.)

(3) "At July 31, 1948, the Corporation had 63 leases having terms of more than three years from that date. The rentals under these leases for the year ending July 31, 1949, amount to a minimum of $2,608,000 plus, in certain instances, real estate taxes and increased amounts based upon percentages of sales. These leases are for varying terms of years and most of them have renewal privileges." (R. H. Macy & Co., Inc.)

(4) "Since 1945 the company or one of its subsidiaries has entered into long-term leases (30 to 35 years) for 23 factory sales and service branches. The companies have the right to purchase the properties after certain specified periods (generally five years from the date of the lease).

"In all cases the rental payments and purchase prices decline gradually over the terms of the leases. The annual rentals on such properties will amount to $326,641 for 1949, exclusive of taxes, insurance, maintenance, and repairs which are also payable by the companies. If all of the rights to purchase were exercisable at the present time the aggregate purchase price would amount to approximately $4,540,000.

"In addition, at December 31, 1948, the companies were lessees under 17 leases having terms extending more than three years (but not more than ten years) from that date. The maximum annual rental requirements thereunder aggregated $86,651." (Freuhauf Trailer Company)

**Hire-purchase agreements.** *Defined.* A hire-purchase agreement is a contract whereby the lessor allows the lessee the use of a piece of property, and, at the termination date set in the contract, gives the lessee title to

the property, and whereby the lessee promises to pay rent at specified intervals and to keep the property in repair.

The payments are fixed so that the tenant soon has a valuable agreement, and it is not unusual for lessees to sell their rights under the agreements to some other persons (after obtaining the lessor's consent to the transfer).

*Accounting on lessee's books.* The two methods of recording hire-purchase agreements are:

| Method No. 1 | | | Method No. 2 | | |
|---|---|---|---|---|---|
| | | When Agreement Is Signed | | | |
| (No entry) | | | Machinery (cash value) . . | \$... | |
| | | | Deferred Interest . . . . | \$... | |
| | | | Contractual Liability . . | | \$... |
| | | When Rent Is Paid | | | |
| Interest Expense . . . . | \$... | | Contractual Liability . . | \$... | |
| Machinery . . . . . | \$... | | Cash . . . . . | | \$... |
| Cash . . . . . | | \$... | Interest Expense . . . . | \$... | |
| | | | Deferred Interest . . . | | \$... |

Under both of the accounting methods, there are three mathematical problems: (a) Ascertaining the cash price, when not given, by assuming a rate of interest; (b) computing the rate of interest when the cash price is given; and (c) amortizing the deferred charge for interest. Hire-purchase agreements involve the same mathematical principles as the amortization of interest-bearing debts when $p$ and $d$ are equal (see pages 236–237).

The cash value of hire-purchase machinery equals the present worth of the periodic payments, so the formula is:

$$CV = I \times a_{\overline{n}|d}$$

If the cash value and the number and size of the periodic payments are known, the effective interest rate may be approximated by interpolation using this formula. As the amortization of the deferred charge for interest involves the same principles as the preparation of a table for the amortization of an interest-bearing debt when $p$ and $d$ are equal, the illustrative problem adapts the data in Illustrative Problem — Case B on page 236.

### *Illustrative Problem*

Amortize the deferred interest balance caused by a hire-purchase agreement calling for 4 periodic rental payments of \$2,885.92, if the cash value of the machinery is \$10,000.

*Solution*

$$\$10{,}000 = \$2{,}885.92 \times a_{\overline{4}|d}$$

$$a_{\overline{4}|d} = 3.46509951$$

But, $a_{\overline{4}|.06} = 3.46510561$, so $d$ is 0.06

**Amortization Table and Entries of Purchaser**

| End of Period | Cash Cr. | Expense Dr. | Machinery Dr. | Calculations |
|---|---|---|---|---|
| 1 | $ 2,885.92 | $ 600.00 | $ 2,285.92 | $2,285.9200 |
| 2 | 2,885.92 | 462.85 | 2,423.07 | 2,423.0752 |
| 3 | 2,885.92 | 317.46 | 2,568.46 | 2,568.4597 |
| 4 | 2,885.92 | 163.37 | 2,722.55 | 2,722.5672 |
| | $11,543.68 | $1,543.68 | $10,000.00 | |

The Calculations figures are the successive valuations found by using the formula, $AD_t = (I - dD) \times (1 + p)^{t-1}$, when both $d$ and $p$ are 0.06. The Machinery Dr. figures are the Calculations figures adjusted so that they add to the cash value of the machinery.

*Use of installment sales concept.*[24] Since the English income tax authorities ruled on January 9, 1929, that the dealer may elect to use the American installment sales procedure for reporting hire-purchase contracts, the actuarial method of allocating the payments between principal and interest is going out of use. That is, if a piano costing £60 is rented on a contract calling for 10 rental payments of £10 each, the dealer may allocate £6 to cost and £4 to profit.

**Amortization of intangible assets.** During the life of most business enterprises, intangible assets will be acquired. The nature and variety of these intangibles may be numerous; there may be also sizable amounts of money involved in their acquisition. The eventual disposition (or nondisposition) of these items brings to the fore several significant accounting problems involving both the presentation of sums on the balance sheet and the stating of periodic income.

Intangible assets, such as goodwill and patents, may be acquired through the firm's program of advertising, research, and experimentation. Goodwill acquired in this manner is commonly omitted from the balance sheet, and the cost of developing it is assigned to expense in the period in which the charge or outlay arises. The cost of patents developed through the firm's own research program is charged to an intangible asset account and amortized over the useful life of the patent (not to exceed the legal life of 17 years).

While the accounting for intangibles which are developed within the firm offers some major difficulty, the discussion in this chapter will be concerned principally with another class, that is, those intangible assets acquired by the issuance of stocks, bonds, or notes, and those purchased for cash. This method of acquisition may involve the purchase of many

[24] Wilmardy, 73 *Accountant* (London) 621; Mackenzie, 92 *Accountant* (London) 388–390.

asset items for a lump sum price, or each item may have a negotiated separate amount associated with it. The accounting problems arising in these instances have been so cogently discussed by the Committee on Accounting Procedure of the American Institute of Accountants that its *Accounting Research Bulletin No. 24* is quoted by permission at length below (three reference footnotes have been omitted):

The intangibles herein considered may be broadly classified as follows:

(a) Those having a term of existence limited by law, regulations, or agreements, or by their nature (such as patents, copyrights, leases, licenses, franchises for a fixed term, and goodwill as to which there is evidence of limited duration).

(b) Those having no such limited term of existence and as to which there is, at the time of acquisition, no indication of limited life (such as goodwill generally, going value, trade names, secret processes, subscription lists, perpetual franchises, and organization costs).

(c) The excess of a parent company's investment in the stock of a subsidiary over its equity in the net assets of the subsidiary as shown by the latter's books at the date of acquisition, in so far as that excess would be treated as an intangible in consolidated financial statements of the parent and the subsidiary. This class of asset may represent intangibles of either type (a) or type (b) above or a combination of both.

The intangibles described above will hereinafter be referred to as type (a) and (b) intangibles, respectively.

### Summary Statement

(1) The initial carrying value of all types of intangibles should be cost, in accordance with the generally accepted accounting principle that assets should be stated at cost when they are acquired. In the case of non-cash acquisitions, cost may be determined either by the fair value of the consideration given or by the fair value of the property acquired, whichever is the more clearly evident.

(2) The cost of type (a) intangibles should be amortized by systematic charges in the income statement over the period benefited, as in the case of other assets having a limited period of usefulness.

(3) The cost of type (b) intangibles may be carried continuously unless and until it becomes reasonably evident that the term of existence of such intangibles has become limited, or that they have become worthless. In the former event the cost should be amortized by systematic charges in the income statement over the estimated remaining period of usefulness or, if such charges would result in distortion of the income statement, a partial write-down may be made by a charge to earned surplus, and the balance of the cost may be amortized over the remaining period of usefulness. If an investment in type (b) intangibles is determined to have become worthless, the carrying value should be charged off either in the income statement, or to earned surplus as, in the circumstances, may be appropriate.* In determining whether an investment in type (b) intangibles has become, or is likely to become worthless, it is proper to take into account any new and related elements of intangible value, acquired or developed, which have replaced or become merged with such intangibles.

* Other problems arising from partial loss of value of type (b) intangibles are not dealt with herein.

(4) Where a corporation decides that a type (b) intangible may not continue to have value during the entire life of the enterprise, it may amortize the cost of such intangible despite the fact that there are no present indications of such limited life which would require reclassification as type (a), and despite the fact that expenditures are being made to maintain its value. In such cases the cost may be amortized over a reasonable period of time, by systematic charges in the income statement. The procedure should be formally approved, preferably by action of the stockholders, and the facts should be fully disclosed in the financial statements. Such amortization is within the discretion of the corporation and is not to be regarded as obligatory.

(5) There is a presumption, when the price paid for a stock investment in a subsidiary is greater than the net assets of such subsidiary applicable thereto, as carried on its books at date of acquisition, that the parent company, in effect, placed a value greater than book value on some of the assets of the subsidiary in arriving at the price it was willing to pay for its investment therein. If practicable there should be an allocation of such excess as between tangible and intangible property and any amount allocated to intangibles should be further allocated to determine a separate cost for each type (a) intangible and for at least the aggregate of all type (b) intangibles. The amounts so allocated to intangibles should thereafter be dealt with in accordance with paragraphs (1), (2), (3), and (4) hereof.

(6) In connection with the foregoing procedures, the committee recognizes that in the past it has been accepted practice to eliminate type (b) intangibles by writing them off against any existing surplus, capital or earned, even though the value of the asset is unimpaired. Since the practice has been long established and widely approved, the committee does not feel warranted in recommending, at this time, adoption of a rule prohibiting such disposition. The committee believes, however, that such dispositions should be discouraged, especially if proposed to be effected by charges to capital surplus.

## Discussion

In dealing with the intangible assets herein considered, important questions arise as to the initial carrying value of such assets, the amortization of carrying value where their term of existence is definitely limited or problematical, and the adjustment of carrying value where there is a substantial and permanent decline in the value of such assets. These questions involve basic accounting principles of balance sheet presentation and income determination. The committee believes that the accounting for intangibles has heretofore been regarded as being of relatively minor importance; accounting practices with respect thereto have varied greatly. The present bulletin is designed to promote a fuller consideration of the relation of intangibles to income and earned surplus.

### *Initial Carrying Value*

The committee has heretofore taken the position that the accounting for tangible fixed assets should normally be based on cost, which may be defined generally as the price paid or consideration given to acquire the asset in question. Attention is now directed to the fact that the same principle is applicable to intangibles.

The committee has considered two further problems which may arise in the determination of the cost of intangibles. Since intangibles are frequently acquired in exchange for securities, the committee points out that in the case of non-cash acquisitions cost may be determined either by the fair value of the consideration

given or by the fair value of the property acquired, whichever is the more clearly evident.

The second problem arises in cases where a group of intangibles or a mixed aggregate of tangible and intangible property is acquired for a lump-sum price or consideration. It is essential in such cases that an allocation of the aggregate cost be made as between tangible and intangible property, and it is manifestly desirable that the cost of intangibles be further allocated to determine a separate cost for each type (a) intangible so acquired and for the aggregate, at least, of all type (b) intangibles.

*Amortization Accounting*

The cost of tangible assets having a limited term of usefulness is dealt with by depreciation accounting, which the committee on terminology has defined as a system of amortization which aims to distribute the cost or other basic value of tangible capital assets, less salvage value (if any), over the estimated useful life of the unit (which may be a group of assets) in a rational manner. In like manner the cost of intangible assets having a limited term of usefulness should be dealt with under amortization accounting. To this end the committee has classified intangibles as between type (a) which includes those having a term of existence limited by law, regulation, or agreement, or by their nature; and type (b) which includes those as to which there is, at the time of acquisition, no evidence of limited life. The committee recognizes that there may be cases in which it is difficult to make such a classification.

The cost of intangibles classified as type (a) should be amortized by systematic charges in the income statement over the period benefited. If it becomes evident that the period benefited will be longer or shorter than originally estimated, recognition thereof may take the form of an appropriate decrease or increase in the rate of amortization or if such increased charges would result in distortion of the income statement a partial write-down may be made by a charge to earned surplus.

The intangibles classified as type (b) may be carried continuously at cost unless and until it becomes reasonably evident that their term of existence has become limited, or that they have become worthless. In the former event they should be reclassified as type (a) and thereafter amortized by systematic charges in the income statement over the estimated remaining period of usefulness. If that period of amortization is relatively short so that misleading inferences might be drawn as a result of the inclusion of substantial charges in the income statement, a partial write-down may be made by a charge to earned surplus and the balance of the cost may be amortized over the remaining period of usefulness.

In the event of complete loss of an investment in type (b) intangibles, a charge should be made either in the income statement or to earned surplus as, in the circumstances, may be appropriate.

In determining whether an investment in type (b) intangibles has or is likely to become worthless, consideration should be given to the fact that in some cases intangibles acquired by purchase may merge with, or be replaced by, intangibles acquired or developed with respect to other products or lines of business, and that in such circumstances the discontinuance of a product or line of business may not in fact indicate loss of value.

*Partial Loss of Value*

The committee recognizes that changes in general economic conditions and changes affecting the business of a particular company may have an important

effect on the value, at a given time, of its intangibles. It further recognizes the difficulty of determining whether adverse changes are temporary or permanent. The problems arising as a result of such partial loss of value (as contrasted with total loss of value discussed above), which are also applicable to tangible assets (such as, loss of commercial value of tangible capital assets not covered by depreciation accounting), are not dealt with herein but are in their broader aspects presently under consideration by the committee. Attention is drawn, however, to Rule No. 2, adopted by the membership of the Institute in 1934, which provides that "capital surplus, however created, should not be used to relieve the income account of the current or future years of charges that would otherwise fall to be made thereagainst."

*Discretionary Amortization of Intangibles*

If a corporation decides to amortize the cost of a type (b) intangible, as to which there is no present indication of limited existence or loss of value, by systematic charges in the income statement, such procedure is permissible despite the fact that expenditures are being made to maintain its value. The plan of amortization should be reasonable; it should be based on all the surrounding circumstances including the basic nature of the intangible and the expenditures being currently made for development, experimentation, and sales promotion. Where the intangibles are important income-producing factors and are being currently maintained by advertising or otherwise, the period of amortization should be reasonably long. The procedure should be formally approved, preferably by action of the stockholders, and should be fully disclosed in the financial statements. The committee believes that such amortization should be entirely within the discretion of the corporation and should not be regarded as mandatory.

. . . .

*Write-off Where There Is No Evidence of Loss of Value*

In adopting the procedures set forth above the committee recognizes that in the past it has generally been considered proper to eliminate the cost of type (b) intangibles from the accounts, in whole or in part, by a charge against any existing surplus, capital or earned, even though the value of the asset is unimpaired. Since the practice has been long established and widely approved, the committee does not feel warranted in recommending, at this time, adoption of a rule prohibiting such disposition. . . .

The committee believes, however, that such dispositions should be discouraged, especially if proposed to be effected by charges to capital surplus. It points out that the reduction of the investment, upon which the responsibility and accountability of management is based, may give rise to misleading inferences if subsequent earnings are compared with the reduced base.

# CHAPTER 10

## Determining Values of Real Property

**Purpose of discussion.** In determining the purchase price to be paid for improved or productive land and buildings certain actuarial mathematical formulas may be employed. In fact, the technical procedures used have become so specialized in recent decades that some persons have devoted their entire efforts in the direction of making valuation work a separate profession in itself. The practice of the accountant often brings him into close association and touch with these professional appraisers. Since this is true the student of advanced accounting should include a review of the essential techniques in his course of study. At the very minimum the accountant should be familiar enough with appraisal procedures that he may be sure that a report which he is considering at the time is acceptable as to techniques and accurate as to mathematical calculations.

The methods and procedures involved in recording an appraisal of an asset which is already on the books of the enterprise are discussed and illustrated in Chapter 11 of this text. In other words, the material in this section deals with the basic principles and terminology employed in determining the price which should be paid for real property if certain assumptions as to revenue potential are granted.

While a study of the material in this chapter should be of some help in gaining a better understanding of the contents of Chapter 11, it is not imperative at all that the mathematics of valuation be studied prior to or along with the recording of fixed asset appraisals.

The following pages are not a substitute for regular textbooks on the subject of the valuation of real property. However, it is hoped that the proving of the valuations by the tabulation of the underlying journal entries will help the accountant to understand better the techniques of valuation. Incidentally, most of the illustrative problems assume that the buildings have a relatively brief life; this assumption shortens the solution and yet does not change the fundamentals of the techniques employed. Because of the limitation of space the legal aspect of valuations is ignored.

**Total return on real property.** The total return on real property is its income ignoring the depletion, obsolescence, and depreciation of the improvements. If the property is rented, the gross revenue is the product of the yearly gross revenue (at 100 per cent occupancy) multiplied by the anticipated occupancy percentage; otherwise, it is the effective gross revenue. If personal property (machinery, equipment, fixtures, etc.) is used in connection with the improvements, an amount large enough to

replace, retire, and pay interest on the investment in the personal property must be deducted along with the average yearly operating expenses and taxes from the gross revenue in order to compute the estimated average yearly net earnings on the real estate.

The total return on real estate, which includes both the interest on the property value and the amortization payments for the depreciable portion of the real estate, obviously is equal to the sum of the land return and the building return, i.e., $TR = LR + BR$.

Certain classes of real estate yield returns in the form of amenities, i.e., contributions to the pleasure of living such as beautiful scenery and congenial neighbors. The amenities are graded and a market value placed on each in order to ascertain the total return from the property.

When the replacement method of valuing property is used, the total return is equal to the price paid for comparable property multiplied by the inferred over-all capitalization rate (comparable property to be new real estate in the market, as the functional quality rating factor is applied later in the valuation process).

**Fee simple title with building of highest and best use.** It is generally accepted that the land returns are residual if the improvements are of highest and best use. There is considerable difference, however, in the valuation procedures.

*Kniskern's method.*[1] Kniskern recommends the use of a single rate for the capitalization of land and building income during the life of the building and the valuation of the land after the exhaustion of the building at the capitalization of the land rentals on a long-term lease at a reversion interest rate, which will normally be lower than the rate used during the life of the building.

*Illustrative Problem*

(Kniskern's Method)

A land site and a building of highest and best use have the prospective net income given in the solution below. After the exhaustion of the building at the end of 10 years, the land has an estimated long-term lease rental of $12,000 per annum. The building has a justified reproduction cost of $250,000 depreciated to $200,000 as of today. Compute the value of the land and building if the interest rate is 7½% per annum for the first 10 years and 6% per annum thereafter.

*Annotated Solution*

A highest and best use building would normally have more than a 10-year future life; the short life was used to shorten the solution. As Kniskern strongly urges the use of round numbers in order to avoid the appearance of unreal accuracy in the valuation, the discounting factors are carried to only 2 decimal places.

[1] Kniskern, P. W., *Real Estate Appraisal and Valuation* (New York: Ronald Press Company, 1933), pp. 409–410, 435, 440, 442.

The amortization of the building is:

$$\$200{,}000 \div a_{\overline{10}|.075} = \$29{,}137 \text{ (rounded off to } \$29{,}100)$$

| Year | Net Income | Income Allotted to Building | Residual Income to Land | Present Value at 7½% | Value of Incomes Allotted to Land |
|---|---|---|---|---|---|
| 1 | $41,600 | $29,100 | $12,500 | 0.93 | $11,625 |
| 2 | 42,100 | 29,100 | 13,000 | 0.87 | 11,310 |
| 3 | 42,600 | 29,100 | 13,500 | 0.80 | 10,800 |
| 4 | 42,350 | 29,100 | 13,250 | 0.75 | 9,938 |
| 5 | 42,100 | 29,100 | 13,000 | 0.70 | 9,100 |
| 6 | 41,850 | 29,100 | 12,750 | 0.65 | 8,288 |
| 7 | 41,700 | 29,100 | 12,600 | 0.60 | 7,560 |
| 8 | 41,500 | 29,100 | 12,400 | 0.56 | 6,944 |
| 9 | 41,400 | 29,100 | 12,300 | 0.52 | 6,396 |
| 10 | 41,250 | 29,100 | 12,150 | 0.49 | 5,954 |
| Value allocated to land from first 10 incomes | | | | | $ 87,915 |
| Residual value of land after building exhaustion: | | | | | |
| Perpetuity of $12,000 deferred 10 years, using 6%: | | | | | |
| ($12,000 ÷ .06) × .5584 | | | | | 111,680 |
| Total value of land | | | | | $199,595 |

The value of the land (rounded off) is $199,600, and the building, which is of highest and best use, is considered worth $200,000, its depreciated reproduction cost.

*Babcock's method.*[2] Babcock recommends the use of a land rate and a building rate. The total real estate returns normally tend to increase at the start of the life of a project and then to decrease. Instead of forecasting the total returns for the entire life of the building, Babcock forecasts the total returns for only about three to five years in order to establish the land returns, which are valued as a perpetuity. He computes the building returns as a varying annuity, which decreases according to the premise selected by the evaluator. Babcock [3] has prepared tables of incomes commencing with $1 one year hence and then following each of the four income premises given below for assets having the following productive lives: 5, 8, 10, 12, 15, 20, 25, 30, 35, 40, 45, and 50 years.

**Babcock's 5-Year Income Table**

| Year | Premise 1 | Premise 2 | Premise 3 | Premise 4 |
|---|---|---|---|---|
| 1 | 1.000000 | 1.000000 | 1.000000 | 1.000000 |
| 2 | 1.000000 | .836203 | .813541 | .800000 |
| 3 | 1.000000 | .656025 | .620510 | .600000 |
| 4 | 1.000000 | .457830 | .420747 | .400000 |
| 5 | 1.000000 | .239816 | .213992 | .200000 |

[2] Babcock, F. M., *The Valuation of Real Estate* (New York: McGraw-Hill Book Company, Inc., 1932), pp. 271, 410–414, 543, 561.
[3] Babcock, *op. cit.*, pp. 562–567.

The first of the Babcock premises assumes that the returns form an ordinary annuity, and the fourth that the returns form an arithmetic annuity in which the successive income installments decline by equal differences. The successive income installments under the second and third premises represent the "annuity balance" figures (reduced to the basis of $1) on the amortization tables prepared by the owner of annuities yielding 10 per cent and 3½ per cent per annum, respectively.

It should be noted that the rate of decline increases as the number of the premise increases. The evaluator, who wishes to use Babcock's tables, should choose the premise which most closely fits the predicted income of the property to be appraised. If the predicted income does not fit any of the four premises, additional tables may be computed by using the following formula:

$$PI = \frac{1 - (1 + i)^{-(n+1-y)}}{1 - (1 + i)^{-n}}$$

where $PI$ is the predicted income; $i$, the interest rate; $n$, the number of years in the total service life of the asset; and $y$, the number of the specific year the income of which is being computed.

Using this formula for a 5-year annuity yielding 5 per cent per annum, the following predicted incomes are obtained (factor $y$ increases from 1 to 5):

$$[1 - (1.05)^{-5}] \div [1 - (1.05)^{-5}] = 1.0000000$$
$$[1 - (1.05)^{-4}] \div [1 - (1.05)^{-5}] = .8190252$$
$$[1 - (1.05)^{-3}] \div [1 - (1.05)^{-5}] = .6290017$$
$$[1 - (1.05)^{-2}] \div [1 - (1.05)^{-5}] = .4294769$$
$$[1 - (1.05)^{-1}] \div [1 - (1.05)^{-5}] = .2199760$$

Note that this series comes in between premises 2 and 3. This is what should be expected because premise 2 is based on 10 per cent and premise 3 on 3½ per cent. The higher the rate of interest the smaller the rate of decline in the successive income installments.

Just what these income installments are mathematically may be seen by tabulating the entries of an investor who buys for $10,000 a 5-year ordinary annuity when interest is 5 per cent per annum (see discussion on pages 239–240).

| End of Year | Cash Dr. | Income Cr. | Annuity Cr. | Annuity Balance |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $10,000.0000 |
| 1 | $2,309.7480 | $500.0000 | $1,809.7480 | 8,190.2520 |
| 2 | 2,309.7480 | 409.5126 | 1,900.2354 | 6,290.0166 |
| 3 | 2,309.7480 | 314.5008 | 1,995.2472 | 4,294.7694 |
| 4 | 2,309.7480 | 214.7385 | 2,095.0095 | 2,199.7599 |
| 5 | 2,309.7480 | 109.9881 | 2,199.7599 | ..... |

The income installments based on a 5-year, 5 per cent annuity are therefore equal to the "annuity balance" figures in an annuity amortization table reduced to the basis of $1.

The present worth of the income installments under premise 1 can be computed as the present worth of an ordinary annuity or read from tabulated $a_{\overline{n}|i}$ valuations. Under premise 4, the present worth of the income installments can be computed as the present worth of an arithmetic annuity in which $d$ is equal to $1/n$ (see special annuity formula 6 on page 218).

The present worth of the income installments under premises other than 1 and 4 must normally be computed by adding the present worths of successive installments as sums certain. For instance, the present worth of the income installments based on a 5-year, 5 per cent annuity evaluated at 5 per cent is:

$$\begin{aligned} 1.0000000 \times (1.05)^{-1} &= .95238095 \\ .8190252 \times (1.05)^{-2} &= .74288000 \\ .6290017 \times (1.05)^{-3} &= .54335532 \\ .4294769 \times (1.05)^{-4} &= .35333171 \\ .2199760 \times (1.05)^{-5} &= .17235695 \\ & \overline{2.76430493} \end{aligned}$$

If the income installments are discounted at the same rate of interest as was used in their calculation, the present worth of the income installments may be computed by using the following formula:

$$S = \frac{a_{\overline{n}|i} - n(1+i)^{-(n+1)}}{1-(1+i)^{-n}}$$

If the income installments based on a 5-year, 5 per cent annuity are evaluated at 5 per cent, we have:

$$S = \frac{a_{\overline{5}|.05} - 5(1.05)^{-6}}{1-(1.05)^{-5}} = 2.764305$$

This formula naturally has but a limited sphere of usefulness as all the interest rates must be identical. Babcock [4] has tabulated the present worth of the income installments based on all four of his premises for years 1 to 100 at 7, 7½, 8, 8½, 9, and 10 per cent, and for years 1 to 50 at 12 and 15 per cent.

***Illustrative Problem***

(Babcock's Method)

The owner in fee simple of a store site will erect either Building A or Building B. The land rate is 6% and the building rate 8%. Both of the proposed buildings have an estimated life of 8 years. The building returns are assumed to decrease annually

[4] Babcock, *op. cit.*, pp. 546–559.

by 12½% of the first year's building return for buildings of highest and best use. The land returns as of the third year are supposed to continue indefinitely.

| | Building A | Building B | Building C |
|---|---|---|---|
| Cost of building exclusive of land | $10,000.00 | $8,000.00 | $8,000.00 |
| Total predicted annual incomes as of end of year: | | | |
| First | 2,915.20 | 2,322.16 | 2,322.16 |
| Second | 2,635.18 | 2,088.14 | 2,088.14 |
| Third | 2,355.15 | 1,904.12 | 1,904.12 |
| Fourth | 2,075.13 | 1,670.10 | 1,670.10 |
| Fifth | 1,720.10 | 1,396.08 | 1,386.08 |
| Sixth | 1,365.08 | 1,122.06 | 1,102.06 |
| Seventh | 1,010.05 | 848.04 | 818.04 |
| Eighth | 655.03 | 574.02 | 534.02 |

Evaluate the real estate, carrying the figures to the nearest cent. Tabulate the investor's entries (see note) for the first 8 years to prove the accuracy of the valuations (this is the reason for carrying the incomes and valuations to the nearest cent).

Case A. Building A, the highest and best use building, was erected. Evaluate immediately after the completion of the building.

Case B. Show that Building B is not a highest and best use building.

Case C. Evaluate Building A, the highest and best use building, 3 years after its erection (omit investor's entries).

Case D. Assuming that Building C was a highest and best use building, evaluate it one year after its completion.

NOTE. The entries in the solutions to the real estate valuation problems are given to explain the valuation principles involved; they have no connection with income for income tax purposes.

*Annotated Solution to Case A*

**Determination of Building and Land Returns**

| | 1st Year | 2nd Year | 3rd Year | 4th Year |
|---|---|---|---|---|
| Predicted total returns | $2,915.20 | $2,635.18 | $2,355.15 | $2,075.13 |
| Building returns: | | | | |
| First year: | | | | |
| $10,000 ÷ 3.5208766 | 2,840.20 | ..... | ..... | ..... |
| Second year: | | | | |
| $2,840.20 × .875 | ..... | 2,485.18 | ..... | ..... |
| Third year: | | | | |
| $2,840.20 × .75 | ..... | ..... | 2,130.15 | ..... |
| Fourth year: | | | | |
| $2,840.20 × .625 | ..... | ..... | ..... | 1,775.13 |
| Land Returns. | $ 75.00 | $ 150.00 | $ 225.00 | $ 300.00 |

Because the building is of highest and best use, its cost must be amortized over the life of the building. As returns are to be a varying annuity, the first year's return is the quotient of the cost divided by the present worth

of the varying annuity. As the varying annuity in this problem is an arithmetic annuity, the special annuity formula 6 on page 218 may be used as follows:

$$a_{\overline{8}|.08} + \frac{-\frac{1}{8}\left[a_{\overline{8}|.08} - 8(1.08)^{-8}\right]}{.08} = 3.5208766$$

As the building returns annually decrease by 12½ per cent of the first year's building return, the first year's return is successively multiplied by 87½ per cent, 75 per cent, and 62½ per cent.

The land returns are residual as the building is of highest and best use.

**Determination of Valuation**

| | |
|---|---|
| Land returns valued at 6%: | |
| First year: | |
| $75 × (1.06)$^{-1}$ | $ 70.75 |
| Second year: | |
| $150 × (1.06)$^{-2}$ | 133.50 |
| Third year: | |
| $225 × (1.06)$^{-3}$ | 188.91 |
| Remaining years (as a deferred perpetuity): | |
| ($300 ÷ .06) × (1.06)$^{-3}$ | 4,198.10 |
| Total land valuation | $ 4,591.26 |
| Building valuation | 10,000.00 |
| Total valuation | $14,591.26 |

As the building is of highest and best use and is new, it is valued at cost. If it had not been new, it would have been valued at depreciated cost.

**INVESTOR'S JOURNAL ENTRIES**

**Entry for Initial Investment**

| | | |
|---|---|---|
| Land | $ 4,591.26 | |
| Building | 10,000.00 | |
| Cash | | $14,591.26 |

**Entries for Land Returns**

| End of Year | Cash Dr. | Land Income Cr. (6%) | Land Dr. | Land Carrying Value |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $4,591.26 |
| 1 | $ 75.00 | $275.48 | $200.48 | 4,791.74 |
| 2 | 150.00 | 287.50 | 137.50 | 4,929.24 |
| 3 | 225.00 | 295.76 | 70.76 | 5,000.00 |
| 4 | 300.00 | 300.00 | ..... | 5,000.00 |
| 5 | 300.00 | 300.00 | ..... | 5,000.00 |
| 6 | 300.00 | 300.00 | ..... | 5,000.00 |
| 7 | 300.00 | 300.00 | ..... | 5,000.00 |
| 8 | 300.00 | 300.00 | ..... | 5,000.00 |

**Entries for Building Returns**

| End of Year | Cash Dr. | Building Income Cr. (8%) | Reserve for Depreciation Cr. | Building Carrying Value |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $10,000.00 |
| 1 | $2,840.20 | $800.00 | $2,040.20 | 7,959.80 |
| 2 | 2,485.18 | 636.78 | 1,848.40 | 6,111.40 |
| 3 | 2,130.15 | 488.91 | 1,641.24 | 4,470.16 |
| 4 | 1,775.13 | 357.61 | 1,417.52 | 3,052.64 |
| 5 | 1,420.10*a* | 244.21 | 1,175.89 | 1,876.75 |
| 6 | 1,065.08*a* | 150.14 | 914.94 | 961.81 |
| 7 | 710.05*a* | 76.94 | 633.11 | 328.70 |
| 8 | 355.03*a* | 26.33 | 328.70 | ..... |

*a.* $2,840.20 multiplied by .50, .375, .25, and .125, respectively.

**Entry for Scrapping Building**

| | | |
|---|---|---|
| Reserve for Depreciation | $10,000.00 | |
| Building | | $10,000.00 |

*Annotated Solution to Case B*

**Schedule Showing Building B Not To Be of Highest and Best Use**

| | 1st Year | 2nd Year | 3rd Year | 4th Year |
|---|---|---|---|---|
| Predicted total returns | $2,322.16 | $2,088.14 | $1,904.12 | $1,670.10 |
| Building returns: | | | | |
| First year: | | | | |
| $8,000.00 ÷ 3.5208766 (see Case A) | 2,272.16 | ..... | ..... | ..... |
| Second year: | | | | |
| $2,272.16 × .875 | ..... | 1,988.14 | ..... | ..... |
| Third year: | | | | |
| $2,272.16 × .75 | ..... | ..... | 1,704.12 | ..... |
| Fourth year: | | | | |
| $2,272.16 × .625 | ..... | ..... | ..... | 1,420.10 |
| Land returns | $ 50.00 | $ 100.00 | $ 200.00 | $ 250.00 |
| Land values at 6%: | | | | |
| First year: | | | | |
| $50.00 × $(1.06)^{-1}$ | | | $ 47.17 | |
| Second year: | | | | |
| $100 × $(1.06)^{-2}$ | | | 89.00 | |
| Third year: | | | | |
| $200 × $(1.06)^{-3}$ | | | 167.92 | |
| Remaining years: | | | | |
| ($250 ÷ .06) × $(1.06)^{-3}$ | | | 3,498.41 | |
| Total | | | $3,802.50 | |

$3,802.50 is less than the land value in Case A so building is not one of highest and best use.

*Annotated Solution to Case C*

The building return for the fourth year is the same as in Case A, i.e., ($10,000 ÷ 3.5208766) × .625 = $1,775.13.

The land return for the fourth year is ($2,075.13 − $1,775.13) or $300.

As the life of the building is 5 years, its valuation is the present worth of a 5-year varying annuity, premise 4, the initial payment of which is $1,775.13.

$$\$1{,}775.13 \times \left[ a_{\overline{5}|.08} + \frac{-\frac{1}{5}\left[a_{\overline{5}|.08} - 5(1.08)^{-5}\right]}{.08} \right] = \$4{,}470.18$$

This valuation agrees, except for a 2-cent error caused by decimals, with the building carrying value at end of the third year in Case A — see page 333.

The valuation of the land is $300 per year in perpetuity, interest 6 per cent, i.e., ($300 ÷ .06) or $5,000 (same as value at end of the third year in Case A — see page 332).

*Annotated Solution to Case D*

**Determination of Building and Land Returns**

| | 2nd Year | 3rd Year | 4th Year |
|---|---|---|---|
| Predicted total returns | $2,088.14 | $1,904.12 | $1,670.12 |
| Building returns: | | | |
| Second year: | | | |
| ($8,000 ÷ 3.5208766) × .875 | 1,988.14 | ..... | ..... |
| Third year: | | | |
| ($8,000 ÷ 3.5208766) × .75 | ..... | 1,704.12 | ..... |
| Fourth year: | | | |
| ($8,000 ÷ 3.5208766) × .625 | ..... | ..... | 1,420.10 |
| Land returns | $ 100.00 | $ 200.00 | $ 250.00 |

The building return for the first year would have been the quotient of $8,000 divided by the present worth of the 8-year varying annuity in Case A, interest 6 per cent. The building return for the second year is 87½ per cent of the first year's return as the annual rate of decline is 12½ per cent.

**Determination of Valuation**

| | |
|---|---|
| Land returns valued at 6%: | |
| Second year: | |
| $100 × $(1.06)^{-1}$ | $ 94.34 |
| Third year: | |
| $200 × $(1.06)^{-2}$ | 178.00 |
| Remaining years (as a deferred perpetuity): | |
| ($250 ÷ .06) × $(1.06)^{-2}$ | 3,708.32 |
| Total land valuation | $ 3,980.66 |
| Building returns valued as 7-year varying annuity, premise 4, initial payment $1,988.14, interest 8%, i.e., | |
| $1{,}988.14 \times \left[ a_{\overline{7}|.08} + \frac{-\frac{1}{7}\left[a_{\overline{7}|.08} - 7(1.08)^{-7}\right]}{.08} \right]$ | 6,367.83 |
| Total valuation | $10,348.49 |

INVESTOR'S JOURNAL ENTRIES

Entry for Original Investment

| | | |
|---|---|---|
| Land | $3,980.66 | |
| Building | 6,367.83 | |
| Cash | | $10,348.49 |

Entries for Land Incomes

| End of Year | Cash Dr. | Land Income Cr. (6%) | Land Dr. | Land Carrying Value |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $3,980.66 |
| 2 | $100.00 | $238.84 | $138.84 | 4,119.50 |
| 3 | 200.00 | 247.17 | 47.17 | 4,166.67 |
| 4 | 250.00 | 250.00 | ..... | 4,166.67 |
| 5 | 250.00 | 250.00 | ..... | 4,166.67 |
| 6 | 250.00 | 250.00 | ..... | 4,166.67 |
| 7 | 250.00 | 250.00 | ..... | 4,166.67 |
| 8 | 250.00 | 250.00 | ..... | 4,166.67 |

Entries for Building Incomes

| End of Year | Cash Dr. | Building Income Cr. (8%) | Reserve for Depreciation Cr. | Building Carrying Value |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $6,367.83 |
| 2 | $1,988.14 | $509.43 | $1,478.71 | 4,889.12 |
| 3 | 1,704.12 | 391.13 | 1,312.99 | 3,576.13 |
| 4 | 1,420.10 | 286.09 | 1,134.01 | 2,442.12 |
| 5 | 1,136.08*a* | 195.37 | 940.71 | 1,501.41 |
| 6 | 852.06*a* | 120.11 | 731.95 | 769.46 |
| 7 | 568.04*a* | 61.56 | 506.48 | 262.98 |
| 8 | 284.02*a* | 21.04 | 262.98 | ..... |

*a.* ($8,000 ÷ 3.5208766) multiplied by .50, .375, .25, and .125, respectively.

Entry for Scrapping Building

| | | |
|---|---|---|
| Reserve for Depreciation | $6,367.83 | |
| Building | | $6,367.83 |

**Fee simple with building not of highest and best use.** *Kniskern's methods.*[5] When a building is too large and costly to be a building of highest and best use, Kniskern recommends the reduction in the value of the building below its cost. This reduced building value is amortized over the life of the building and the land valued according to the ordinary procedure (see pages 327–328).

When a building is inadequate, Kniskern computes the land returns during the life of the building by subtracting the amortization of the building from the predicted total returns. These land returns are valued as an

[5] Kniskern, *op. cit.*, pp. 445–447.

annuity having a term equal to the life of the building. The annual potential rental value, when improved by a highest and best use building, is valued as a perpetuity deferred for the life of the actual building. The total value of the land is equal to the sum of the two valuations.

*Babcock's method — building in early life.*[6] Babcock recommends that the land returns for land actually occupied by a building not of highest and best use be determined by using the statistics for a hypothetical building of highest and best use. The total returns for the actual project minus the land returns, as computed by using the statistics for the hypothetical building, equal the building returns.

### *Illustrative Problem*

If Building B in the problem on pages 330–331 were erected and Building A were taken as the hypothetical building of highest and best use, evaluate Building B and the land according to the conditions in the original problem and give the investor's entries.

*Annotated Solution*

**Determination of Building Returns**

| | 1st Year | 2nd Year | 3rd Year | 4th Year |
|---|---|---|---|---|
| Predicted total returns | $2,322.16 | $2,088.14 | $1,904.12 | $1,670.10 |
| Land returns if improved with Building A (see page 331) | 75.00 | 150.00 | 225.00 | 300.00 |
| Residual building returns | $2,247.16 | $1,938.14 | $1,679.12 | $1,370.10 |

**Determination of Valuation**

| | |
|---|---|
| Building returns valued at 8%: | |
| First year: | |
| $\$2,247.16 \times (1.08)^{-1}$ | $ 2,080.70 |
| Second year: | |
| $\$1,938.14 \times (1.08)^{-2}$ | 1,661.64 |
| Third year: | |
| $\$1,679.12 \times (1.08)^{-3}$ | 1,332.94 |
| Remaining years (as 5-year varying annuity, first payment $1,370.10, premise 4, deferred 3 years): | |
| $\$1,370.10 \times \left[a_{\overline{5}|.08} + \frac{-\frac{1}{5}[a_{\overline{5}|.08} - 5(1.08)^{-5}]}{.08}\right] \times (1.08)^{-3}$ | 2,738.90 |
| Building valuation | $ 7,814.18 |
| Land valuation (see Case A on page 332) | 4,591.26 |
| Total valuation | $12,405.44 |

**INVESTOR'S JOURNAL ENTRIES**

**Entry for Original Investment**

| | | |
|---|---|---|
| Land | $4,591.26 | |
| Building | 7,814.18 | |
| Cash | | $12,405.44 |

[6] Babcock, *op. cit.*, pp. 271, 286.

**Entries for Land Incomes**

| End of Year | Cash Dr. | Land Income Cr. (6%) | Land Dr. | Land Carrying Value |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $4,591.26 |
| 1 | $ 75.00 | $275.48 | $200.48 | 4,791.74 |
| 2 | 150.00 | 287.50 | 137.50 | 4,929.24 |
| 3 | 225.00 | 295.76 | 70.76 | 5,000.00 |
| 4 | 300.00 | 300.00 | ..... | 5,000.00 |
| 5 | 300.00 | 300.00 | ..... | 5,000.00 |
| 6 | 300.00 | 300.00 | ..... | 5,000.00 |
| 7 | 300.00 | 300.00 | ..... | 5,000.00 |
| 8 | 300.00 | 300.00 | ..... | 5,000.00 |

**Entries for Building Incomes**

| End of Year | Cash Dr. (a) | Building Income Cr. (8%) | Reserve for Depreciation Cr. | Building Carrying Value |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $7,814.18 |
| 1 | $2,247.16 | $625.13 | $1,622.03 | 6,192.15 |
| 2 | 1,938.14 | 495.37 | 1,442.77 | 4,749.38 |
| 3 | 1,679.12 | 379.95 | 1,299.17 | 3,450.21 |
| 4 | 1,370.10 | 276.02 | 1,094.08 | 2,356.13 |
| 5 | 1,096.08 | 188.49 | 907.59 | 1,448.54 |
| 6 | 822.06 | 115.88 | 706.18 | 742.36 |
| 7 | 548.04 | 59.39 | 488.65 | 253.71 |
| 8 | 274.02 | 20.31 | 253.71 | ..... |

*a.* Total annual incomes (see page 331) minus land incomes.

**Entry for Scrapping Building**

| | | |
|---|---|---|
| Reserve for Depreciation | $7,814.18 | |
| Building | | $7,814.18 |

*Babcock's method — building in mid-life.*[7] Babcock recommends that the building returns for properties with mid-life or late-life buildings be made residual, and that the land returns be determined without reference to the existing building by means of either the hypothetical building technique or the appraisal of the land by comparison procedure. As the use of the hypothetical building technique has already been developed, the following problem uses the appraisal of the land by comparison procedure.

***Illustrative Problem***

The value of a store site is set at $5,000 by comparison. The land rate is 6% and the building rate 8%. The building is in mid-life and has a remaining life of 6

[7] Babcock, *op. cit.*, pp. 294–298.

years. The total returns in the building's seventh and eighth years are assumed to be $1,400 and $1,300, respectively, but thereafter the building returns will decline according to: Case A — premise 4; Case B — premise 2. Evaluate and tabulate the investor's journal entries under both cases.

*Annotated Solution to Case A*

**Determination of Residual Building Returns**

| | 7th Year | 8th Year |
|---|---|---|
| Predicted total returns | $1,400 | $1,300 |
| Land returns ($5,000 × .06) | 300 | 300 |
| Building returns | $1,100 | $1,000 |

**Determination of Valuation**

Building returns valued at 8%:

Seventh year:

$1,100 × $(1.08)^{-1}$ . . . . . $1,018.52

Eighth year:

$1,000 × $(1.08)^{-2}$ . . . . . 857.34

Remaining years (as 4-year varying annuity, first payment $800, premise 4, deferred 2 years):

$$\$800 \times \left[ a\overline{4}_{.08} + \frac{-\frac{1}{4}[a\overline{4}_{.08} - 4(1.08)^{-4}]}{.08} \right] \times (1.08)^{-2} \quad . . . . . \quad 1{,}474.35$$

| | |
|---|---|
| Building valuation | $3,350.21 |
| Land valuation (by comparison procedure) | 5,000.00 |
| Total valuation | $8,350.21 |

**INVESTOR'S JOURNAL ENTRIES**

**Entry for Original Purchase** (End 6th Year)

| | | |
|---|---|---|
| Land | $5,000.00 | |
| Building | 3,350.21 | |
| Cash | | $8,350.21 |

**Entries for Land Incomes**

| End of Year | Cash Dr. | Land Income Cr. (6%) | Land Carrying Value |
|---|---|---|---|
| 0 | .... | .... | $5,000 |
| 7 | $300 | $300 | 5,000 |
| 8 | 300 | 300 | 5,000 |
| 9 | 300 | 300 | 5,000 |
| 10 | 300 | 300 | 5,000 |
| 11 | 300 | 300 | 5,000 |
| 12 | 300 | 300 | 5,000 |

**Entries for Building Incomes**

| End of Year | Cash Dr. | Building Income Cr. (8%) | Reserve for Depreciation Cr. | Building Carrying Value |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $3,350.21 |
| 7 | $1,100.00 | $268.02 | $831.98 | 2,518.23 |
| 8 | 1,000.00 | 201.46 | 798.54 | 1,719.69 |
| 9 | 800.00*a* | 137.58 | 662.42 | 1,057.27 |
| 10 | 600.00*a* | 84.58 | 515.42 | 541.85 |
| 11 | 400.00*a* | 43.35 | 356.65 | 185.20 |
| 12 | 200.00*a* | 14.80 | 185.20 | ..... |

*a*. $1,000 multiplied by .80, .60, .40, and .20, respectively.

**Entry for Scrapping Building**

| | | |
|---|---|---|
| Reserve for Depreciation | $3,350.21 | |
| Building | | $3,350.21 |

*Annotated Solution to Case B*

**Computation and Valuation of Building Returns**

(Premise 2, 10%, 4-year annuity — see page 329)

$$[1 - (1.10)^{-4}] \div [1 - (1.10)^{-4}] = 1.0000000$$
$$[1 - (1.10)^{-3}] \div [1 - (1.10)^{-4}] = .7845292$$
$$[1 - (1.10)^{-2}] \div [1 - (1.10)^{-4}] = .5475113$$
$$[1 - (1.10)^{-1}] \div [1 - (1.10)^{-4}] = .2867916$$

Present worth of 4-period annuity at 8%:

$$1.0000000 \times (1.08)^{-1} = .92592593$$
$$.7845292 \times (1.08)^{-2} = .67260734$$
$$.5475113 \times (1.08)^{-3} = .43463212$$
$$.2867916 \times (1.08)^{-4} = .21080039$$
$$\text{Total} \quad 2.24396578^{8}$$

**Determination of Building Returns**

| | 7th Year | 8th Year |
|---|---|---|
| Predicted total returns | $1,400 | $1,300 |
| Land returns ($5,000 × .06) | 300 | 300 |
| Building returns | $1,100 | $1,000 |

[8] Babcock, *op. cit.*, p. 550 (table gives value as 2.2440).

### Determination of Valuation

| | |
|---|---|
| Building returns valued at 8%: | |
| Seventh year: | |
| $1,100 × (1.08)$^{-1}$ | $1,018.52 |
| Eighth year: | |
| $1,000 × (1.08)$^{-2}$ | 857.34 |
| Remaining years: | |
| $800 × 2.24396578 × (1.08)$^{-2}$ | 1,539.07 |
| Building valuation | $3,414.93 |
| Land valuation (by comparison procedure) | 5,000.00 |
| Total valuation | $8,414.93 |

## INVESTOR'S JOURNAL ENTRIES

### Entry for Original Investment (End 6th Year)

| | | |
|---|---|---|
| Land | $5,000.00 | |
| Building | 3,414.93 | |
| Cash | | $8,414.93 |

### Entries for Land Incomes

| End of Year | Cash Dr. | Land Income Cr. (6%) | Land Carrying Value |
|---|---|---|---|
| 0 | .... | .... | $5,000 |
| 7 | $300 | $300 | 5,000 |
| 8 | 300 | 300 | 5,000 |
| 9 | 300 | 300 | 5,000 |
| 10 | 300 | 300 | 5,000 |
| 11 | 300 | 300 | 5,000 |
| 12 | 300 | 300 | 5,000 |

### Entries for Building Incomes

| End of Year | Cash Dr. | Building Income Cr. (8%) | Reserve for Depreciation Cr. | Building Carrying Value |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $3,414.93 |
| 7 | $1,100.00 | $273.19 | $826.81 | 2,588.12 |
| 8 | 1,000.00 | 207.05 | 792.95 | 1,795.17 |
| 9 | 800.00 | 143.61 | 656.39 | 1,138.78 |
| 10 | 627.62*a* | 91.10 | 536.52 | 602.26 |
| 11 | 438.01*b* | 48.18 | 389.83 | 212.43 |
| 12 | 229.43*c* | 17.00 | 212.43 | ..... |

*a*. $800 × .7845292 = $627.62336.
*b*. $800 × .5475113 = $438.00904.
*c*. $800 × .2867916 = $229.43328.

### Entry for Scrapping Building

| | | |
|---|---|---|
| Reserve for Depreciation | $3,414.93 | |
| Building | | $3,414.93 |

**Leased fees.** In evaluating leased fees, the appraiser starts with a valuation in fee simple. The valuation of the leased fee is the sum of the present worth of the stipulated rentals, the present worth of the land returns after the duration of the lease, and the present worth of the building returns after the duration of the lease.[9]

*Illustrative Problem*

The owner in fee simple of Building A (see problem on page 330) and its site rented at the end of the building's first year the land and building for $2,000 a year. If the rental interest rate is 5%, the building reversion rate is 8%, and the land reversion rate is 6%, evaluate the leased fee and tabulate the owner's entries if the duration of the lease is: Case A, 7 years; Case B, 5 years.

*Solution*

CASE A

**Evaluation of Leased Fee**

| | |
|---|---|
| Value of rentals: | |
| $2,000 × $a_{7|.05}$ | $11,572.75 |
| Value of reversions: | |
| Building, nil; life exhausted. | |
| Land: | |
| Land return $300 as per previous problem (see page 331) | |
| ($300 ÷ .06) × $(1.06)^{-7}$ | 3,325.29 |
| Total valuation | $14,898.04 |

**OWNER'S JOURNAL ENTRIES**

**Entry for Original Investment**

| | | |
|---|---|---|
| Building | $10,000.00 | |
| Land | 4,591.26 | |
| Cash (see page 332) | | $14,591.26 |

**Entry for First Year's Land Income**

| | | |
|---|---|---|
| Cash (see page 332) | 75.00 | |
| Land | 200.48 | |
| Land Income | | 275.48 |

**Entry for First Year's Building Income**

| | | |
|---|---|---|
| Cash (see page 333) | 2,840.20 | |
| Building Income | | 800.00 |
| Reserve for Depreciation | | 2,040.20 |

**Entry for Lease**

| | | |
|---|---|---|
| Lease | 11,572.75 | |
| Reserve for Depreciation | 2,040.20 | |
| Land [($4,591.26 + $200.48) − $3,325.29] | | 1,466.45 |
| Buildings | | 10,000.00 |
| Profit and Loss | | 2,146.50 |

[9] Babcock, *op. cit.*, pp. 347–363; Kniskern, *op. cit.*, pp. 480, 485–488.

**Entries for Lease Rentals**

| End of Year | Cash Dr. | Lease Income Cr. (5%) | Lease Cr. | Lease Carrying Value |
|---|---|---|---|---|
| 1 | ..... | ..... | ..... | $11,572.75 |
| 2 | $2,000.00 | $578.64 | $1,421.36 | 10,151.39 |
| 3 | 2,000.00 | 507.57 | 1,492.43 | 8,658.96 |
| 4 | 2,000.00 | 432.95 | 1,567.05 | 7,091.91 |
| 5 | 2,000.00 | 354.60 | 1,645.40 | 5,446.51 |
| 6 | 2,000.00 | 272.33 | 1,727.67 | 3,718.84 |
| 7 | 2,000.00 | 185.94 | 1,814.06 | 1,904.78 |
| 8 | 2,000.00 | 95.22 | 1,904.78 | ..... |

**Entry for Increments in Land Value**

| End of Year | Land Dr. | Land Income Cr. (6%) | Land Carrying Value |
|---|---|---|---|
| 1 | ..... | ..... | $3,325.29 |
| 2 | $199.52 | $199.52 | 3,524.81 |
| 3 | 211.49 | 211.49 | 3,736.30 |
| 4 | 224.18 | 224.18 | 3,960.48 |
| 5 | 237.63 | 237.63 | 4,198.11 |
| 6 | 251.89 | 251.89 | 4,450.00 |
| 7 | 267.00 | 267.00 | 4,717.00 |
| 8 | 283.00 | 283.00 | 5,000.00 |

## Case B

**Evaluation of Leased Fee**

Value of rentals:
$2,000 × $a_{\overline{8}|.05}$ . . . . . $ 8,658.95
Value of building reversion:
Building return:
First year:
$2,840.20 (see page 331)
Seventh year:
$2,840.20 × .25* = $710.05
Building value, end of 6th year, 8%, 2 years, premise 4:
$710.05 × 1.3545953† × $(1.08)^{-5}$ . . . . . 654.61
Value of land reversion:
Land return $300 (see page 331):
($300 ÷ .06) × $(1.06)^{-5}$ . . . . . 3,736.29
Total valuation . . . . . $13,049.85

* Return declines 12½% annually; [1.00 − (6 × .125)] = .25
† Present worth of 2-year varying annuity, premise 4, interest 8%:

$$a_{\overline{8}|.08} + \frac{-\frac{1}{2}[a_{\overline{8}|.08} - 2(1.08)^{-2}]}{.08} = 1.3545953$$

## INVESTOR'S JOURNAL ENTRIES

### Entry for Original Investment

| | | |
|---|---|---|
| Land | $ 4,591.26 | |
| Building | 10,000.00 | |
| Cash (see page 332) | | $14,591.26 |

### Entry for First Year's Land Income

| | | |
|---|---|---|
| Cash (see page 332) | 75.00 | |
| Land | 200.48 | |
| Land Income | | 275.48 |

### Entry for First Year's Building Income

| | | |
|---|---|---|
| Cash (see page 333) | 2,840.24 | |
| Building Income | | 800.00 |
| Reserve for Depreciation | | 2,040.20 |

### Entry for Lease

| | | |
|---|---|---|
| Lease | 8,658.95 | |
| Land [($4,591.26 + $200.48) − $3,736.29] | | 1,055.45 |
| Building [($10,000 − $2,040.20) − $654.61] | | 7,305.19 |
| Profit and Loss | | 298.31 |

### Entry for Lease Rentals

| End of Year | Cash Dr. | Lease Income Cr. (5%) | Lease Cr. | Lease Carrying Value |
|---|---|---|---|---|
| 1 | ..... | ..... | ..... | $8,658.95 |
| 2 | $2,000.00 | $432.95 | $1,567.05 | 7,091.90 |
| 3 | 2,000.00 | 354.60 | 1,645.40 | 5,446.50 |
| 4 | 2,000.00 | 272.33 | 1,727.67 | 3,718.83 |
| 5 | 2,000.00 | 185.94 | 1,814.06 | 1,904.77 |
| 6 | 2,000.00 | 95.23 | 1,904.77 | ..... |

### Entries for Land Returns

| End of Year | Cash Dr. | Land Dr. | Land Income Cr. (6%) | Lease Carrying Value |
|---|---|---|---|---|
| 1 | ..... | ..... | ..... | $3,736.29 |
| 2 | ..... | $224.18 | $224.18 | 3,960.47 |
| 3 | ..... | 237.63 | 237.63 | 4,198.10 |
| 4 | ..... | 251.89 | 251.89 | 4,449.99 |
| 5 | ..... | 267.00 | 267.00 | 4,716.99 |
| 6 | ..... | 283.01 | 283.01 | 5,000.00 |
| 7 | $300.00 | ..... | 300.00 | 5,000.00 |
| 8 | 300.00 | ..... | 300.00 | 5,000.00 |

**Entries for Building Returns**

| End of Year | Cash Dr. (a) | Building Dr. | Building Income Cr. (8%) | Reserve for Depreciation Cr. | Building Carrying Value |
|---|---|---|---|---|---|
| 1 | ..... | ..... | ..... | ..... | $654.61 |
| 2 | ..... | $52.37 | $52.37 | ..... | 706.98 |
| 3 | ..... | 56.56 | 56.56 | ..... | 763.54 |
| 4 | ..... | 61.08 | 61.08 | ..... | 824.62 |
| 5 | ..... | 65.97 | 65.97 | ..... | 890.59 |
| 6 | ..... | 71.25 | 71.25 | ..... | 961.84 |
| 7 | $710.05 | ..... | 76.95 | $633.10 | 328.74 |
| 8 | 355.03 | ..... | 26.29 | 328.74 | ..... |

a. Building returns for 7th and 8th years same as in Case A (page 333).

**Entry for Scrapping Building**

| | | |
|---|---|---|
| Reserve for Depreciation ($2,040.20 + $633.10 + $328.74) . . | $3,002.04 | |
| Building . . . . . | | $3,002.04 |

**Leasehold estates.**[10] An appraisal of a leasehold estate starts with the determination of the land and building returns in fee simple. If the valuation is made upon the completion of the building by the lessee, the building returns must amortize the cost, exclusive of land, plus ground rent during construction. The total returns on the property minus the ground rent are the total returns on the leasehold estate. With buildings in early life, the total returns on the leasehold estate minus the building returns give the returns on the leasehold interest in land. If the ground rent is greater than the land return, there is no leasehold interest in land, and the building is worth less than its normal valuation (see second illustrative problem).

If the building on the leasehold is in mid-life or late life, the return on the leasehold interest in land is the excess of the land return (secured by valuation in fee simple) and the ground rent. Then the return on the leasehold interest in the building is the residual amount found by subtracting the return on the leasehold in the land from the total return of the entire leasehold estate.

***Illustrative Problem No. 1***

(Fee simple valuations by Babcock's method)

The purchaser of a store site immediately leased the land for a period of 7 years at $175 a year. If the lessee erected a building of highest and best use (life 8 years) at a cost of $10,000 exclusive of ground rent (erection took one year), tabulate the entries (A) of the owner of the site who acquires title to the building at the termination of the lease, and (B) of the lessee. The purchase price for the site was its valuation. The building returns are assumed to follow premise 4, and the land returns are assumed to become constant after the building is 3 years old. The total net predicted returns are: First year nil, second year $3,053.81, third year $2,784.58,

[10] Babcock, *op. cit.*, pp. 364–382.

fourth year $2,465.36, and fifth year $2,136.13. The land rate is 6%, the building rate 8%, land reversion rate 6%, building reversion rate 8%, rental interest rate 5%, building leasehold rate 8%, and land leasehold rate 9%.

*Annotated Solution*

**Determination of Land and Building Returns in Fee Simple**

| | 2nd Year | 3rd Year | 4th Year | 5th Year |
|---|---|---|---|---|
| Predicted total returns | $3,053.81 | $2,784.58 | $2,465.36 | $2,136.13 |
| Building returns: | | | | |
| Second year: | | | | |
| $10,175 ÷ 3.5208766* | 2,889.91 | ..... | ..... | ..... |
| Third year: | | | | |
| $2,889.91 × .875 | ..... | 2,528.67 | ..... | ..... |
| Fourth year: | | | | |
| $2,889.91 × .75 | ..... | ..... | 2,167.43 | ..... |
| Fifth year: | | | | |
| $2,889.91 × .625 | ..... | ..... | ..... | 1,806.19 |
| Land returns | $ 163.90 | $ 255.91 | $ 297.93 | $ 329.94 |

* Present worth of 8-year varying annuity, premise 4, 8%, as in Case A (page 332).

**Determination of Valuation in Fee Simple**

| | |
|---|---|
| Land returns valued at 6%: | |
| Second year: | |
| $163.90 × $(1.06)^{-2}$ | $ 145.87 |
| Third year: | |
| $255.91 × $(1.06)^{-3}$ | 214.87 |
| Fourth year: | |
| $297.93 × $(1.06)^{-4}$ | 235.99 |
| Remaining years: | |
| ($329.94 ÷ .06) × $(1.06)^{-4}$ | 4,355.72 |
| Land valuation | $ 4,952.45 |
| Building valuation: | |
| $10,175 × $(1.08)^{-1}$ | 9,421.30 |
| Total valuation | $14,373.75 |

**Proof of Valuations**

| Year | Cash Dr. | Land Income Cr. (6%) | Land Dr. | Land Carrying Value |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $4,952.45 |
| 1 | ..... | $297.15 | $297.15 | 5,249.60 |
| 2 | $163.90 | 314.98 | 151.08 | 5,400.68 |
| 3 | 255.91 | 324.04 | 68.13 | 5,468.81 |
| 4 | 297.93 | 328.12 | 30.19 | 5,499.00 |
| 5 | 329.94 | 329.94 | ..... | 5,499.00 |
| 6 | 329.94 | 329.94 | ..... | 5,499.00 |
| 7 | 329.94 | 329.94 | ..... | 5,499.00 |
| 8 | 329.94 | 329.94 | ..... | 5,499.00 |
| 9 | 329.94 | 329.94 | ..... | 5,499.00 |

| Year | Cash Dr. | Building Income Cr. (8%) | Building Dr. | Reserve for Depreciation | Building Carrying Value |
|---|---|---|---|---|---|
| 0 | ..... | ..... | ..... | ..... | $ 9,421.30 |
| 1 | ..... | $753.70 | $753.70 | ..... | 10,175.00 |
| 2 | $2,889.91 | 814.00 | ..... | $2,075.91 | 8,099.09 |
| 3 | 2,528.67 | 647.93 | ..... | 1,880.74 | 6,218.35 |
| 4 | 2,167.43 | 497.47 | ..... | 1,669.96 | 4,548.39 |
| 5 | 1,806.19 | 363.87 | ..... | 1,442.32 | 3,106.07 |
| 6 | 1,444.96*a* | 248.49 | ..... | 1,196.47 | 1,909.60 |
| 7 | 1,083.72*a* | 152.77 | ..... | 930.95 | 978.65 |
| 8 | 722.48*a* | 78.29 | ..... | 644.19 | 334.46 |
| 9 | 361.24*a* | 26.78 | ..... | 334.46 | ..... |

*a*. $2,889.91 multiplied by .50, .375, .25, and .125, respectively.

### Evaluation of Leased Fee

Value of rentals:
$175 × $a_{\overline{7}|.05}$ . . . . . $1,012.62
Value of building reversion:
First year of building's life:
$2,889.91 (as above)
Seventh year of building's life:
$2,889.91 × .25* = $722.48
Building value, 2 years, premise 4, 8%:
$722.48 × 1.3545953† × $(1.08)^{-7}$ . . . . . 571.04
Value of land reversion:
[$329.94‡ ÷ .06] × $(1.06)^{-7}$ . . . . . 3,657.15
Total valuation . . . . . $5,240.81

* Seventh year of building's life is 7 years hence due to year in building, i.e., 1.00 − (6 × .125) = .25.
† Present worth of 2-year varying annuity, premise 4, 8% (see page 342).
‡ Land rental as above.

The above solution supplements the leased fee problem on page 341, as the first problem had the lessor erect the building and this problem has the lessee do the construction work.

## LESSOR'S JOURNAL ENTRIES

### Entry for Site

| | | |
|---|---|---|
| Land (see valuation on page 345) . . . . . | $4,952.45 | |
| Cash . . . . . | | $4,952.45 |

### Entry for Lease

| | | |
|---|---|---|
| Lease . . . . . | 1,012.62 | |
| Building . . . . . | 571.04 | |
| Land ($4,952.45 − $3,657.15) . . . . . | | 1,295.30 |
| Profit and Loss . . . . . | | 288.36 |

### Entries for Lease Rentals

| End of Year | Cash Dr. | Lease Income Cr. (5%) | Lease Cr. | Lease Carrying Value |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $1,012.62 |
| 1 | $175.00 | $50.63 | $124.37 | 888.25 |
| 2 | 175.00 | 44.41 | 130.59 | 757.66 |
| 3 | 175.00 | 37.88 | 137.12 | 620.54 |
| 4 | 175.00 | 31.03 | 143.97 | 476.57 |
| 5 | 175.00 | 23.83 | 151.17 | 325.40 |
| 6 | 175.00 | 16.27 | 158.73 | 166.67 |
| 7 | 175.00 | 8.33 | 166.67 | ..... |

### Entries for Land Incomes

| End of Year | Cash Dr. | Land Dr. | Land Income Cr. (6%) | Land Carrying Value |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $3,657.15 |
| 1 | ..... | $219.43 | $219.43 | 3,876.58 |
| 2 | ..... | 232.59 | 232.59 | 4,109.17 |
| 3 | ..... | 246.55 | 246.55 | 4,355.72 |
| 4 | ..... | 261.34 | 261.34 | 4,617.06 |
| 5 | ..... | 277.02 | 277.02 | 4,894.08 |
| 6 | ..... | 293.64 | 293.64 | 5,188.72 |
| 7 | ..... | 311.28 | 311.28 | 5,499.00 |
| 8 | $329.94*a* | ..... | 329.94 | 5,499.00 |
| 9 | 329.94*a* | ..... | 329.94 | 5,499.00 |

*a*. Same as figures in Proof of Valuations on page 345.

### Entries for Building Incomes

| End of Year | Cash Dr. | Building Dr. | Building Income Cr. (8%) | Reserve for Depreciation Cr. | Building Carrying Value |
|---|---|---|---|---|---|
| 0 | ..... | ..... | ..... | ..... | $571.04 |
| 1 | ..... | $45.68 | $45.68 | ..... | 616.72 |
| 2 | ..... | 49.34 | 49.34 | ..... | 666.06 |
| 3 | ..... | 53.28 | 53.28 | ..... | 719.34 |
| 4 | ..... | 57.55 | 57.55 | ..... | 776.89 |
| 5 | ..... | 62.15 | 62.15 | ..... | 839.04 |
| 6 | ..... | 67.12 | 67.12 | ..... | 906.16 |
| 7 | ..... | 72.49 | 72.49 | ..... | 978.65 |
| 8 | $722.48*a* | ..... | 78.29 | $644.19 | 334.46 |
| 9 | 361.24*a* | ..... | 26.78 | 334.46 | ..... |

*a*. Same as figures in Proof of Valuations on page 346.

### Entry for Scrapping Building

| | | |
|---|---|---|
| Reserve for Building | $978.65 | |
| Building | | $978.65 |

**Determination of Returns on Leasehold Interest in Land**

| | 2nd Year of Lease | 3rd Year of Lease | 4th Year of Lease | 5th Year of Lease |
|---|---|---|---|---|
| Predicted total returns | $3,053.81 | $2,784.58 | $2,465.36 | $2,136.13 |
| Lease rental | 175.00 | 175.00 | 175.00 | 175.00 |
| Total leasehold returns | $2,878.81 | $2,609.58 | $2,290.36 | $1,961.13 |
| Building returns as in fee simple | 2,889.91 | 2,528.67 | 2,167.43 | 1,806.19 |
| Leasehold interest in land returns | $ 11.10* | $ 80.91 | $ 122.93 | $ 154.94 |

* Denotes negative.

**Valuation of Leasehold Interest in Land**

(As of End of First Year of Lease)

| | |
|---|---|
| Second year's return: | |
| $11.10* \times (1.09)^{-1}$ | $ 10.18* |
| Third year's return: | |
| $80.91 \times (1.09)^{-2}$ | 68.10 |
| Fourth year's return: | |
| $122.93 \times (1.09)^{-3}$ | 94.93 |
| Remaining years' returns | |
| $154.94 \times a_{\overline{3}|.09} \times (1.09)^{-3}$ | 302.86 |
| Valuation of leasehold interest in land | $455.71 |

* Denotes negative.

**Valuation of Leasehold Interest in Building**

(As of End of First Year of Lease)

While the value of the building may be computed by adding the discounted building returns for the first 6 years, interest 8%, normally it is quicker to subtract from the valuation upon completion the present worth of the building returns lost by the termination of the lease, i.e.:

| | |
|---|---|
| Building value upon completion | $10,175.00 |
| Building return, 7th year, premise 4, interest 8%: | |
| ($10,175 ÷ 3.5208766*) × .25 = $722.48 | |
| Building reversion value, 2 years, premise 4, interest 8%, discounted for 6 years: | |
| $722.48 × 1.3545953† × $(1.08)^{-6}$ | 616.73 |
| Valuation of leasehold interest in building | $ 9,558.27 |

* Present worth of 8-year varying annuity, premise 4, 8% (see page 332).
† Present worth of 2-year varying annuity, premise 4, 8% (see page 342).

## LESSOR'S JOURNAL ENTRIES

**Entry for Erection of Building and First Year's Rent**

| | | |
|---|---|---|
| Leasehold Interest in Land | $ 455.71 | |
| Leasehold Interest in Building | 9,558.27 | |
| Profit and Loss | 161.02 | |
| Cash | | $10,175.00 |

**Annual Entry for Rent** (2nd to 7th years, inclusive)

| | | |
|---|---|---|
| Rent Expense | $175.00 | |
| Cash | | $175.00 |

**Entries for Land Returns**

| Year of Lease | Rent Expense Dr. | Interest Income Cr. (9%) | Leasehold Interest in Land Cr. | Leasehold Interest in Land Carrying Value |
|---|---|---|---|---|
| 1 | ..... | ..... | ..... | $455.71 |
| 2 | $ 11.10* | $41.01 | $ 52.11* | 507.82 |
| 3 | 80.91 | 45.70 | 35.21 | 472.61 |
| 4 | 122.93 | 42.53 | 80.40 | 392.21 |
| 5 | 154.94 | 35.30 | 119.64 | 272.57 |
| 6 | 154.94 | 24.53 | 130.41 | 142.16 |
| 7 | 154.94 | 12.78 | 142.16 | ..... |

* Denotes negative.

**Entries for Building Returns**

| Year of Lease | Rent Expense Dr. (a) | Interest Income Cr. (8%) | Leasehold Interest in Building Cr. | Leasehold Interest in Building Carrying Value |
|---|---|---|---|---|
| 1 | ..... | ..... | ..... | $9,558.27 |
| 2 | $2,889.91 | $764.66 | $2,125.25 | 7,433.02 |
| 3 | 2,528.67 | 594.64 | 1,934.03 | 5,498.99 |
| 4 | 2,167.43 | 439.92 | 1,727.51 | 3,771.48 |
| 5 | 1,806.19 | 301.72 | 1,504.47 | 2,267.01 |
| 6 | 1,444.96 | 181.36 | 1,263.60 | 1,003.41 |
| 7 | 1,083.72 | 80.31 | 1,003.41 | ..... |

*a.* Respective Cash Dr. figures in Proof of Valuation of Building in Fee Simple (see page 346).

### *Illustrative Problem No. 2*

Rework Illustrative Problem No. 1, in so far as it affects the lessee, if the annual ground rent is $400 instead of $175.

*Annotated Solution*

**Determination of Land and Building Returns in Fee Simple**

| | 2nd Year | 3rd Year | 4th Year | 5th Year |
|---|---|---|---|---|
| Predicted total returns | $3,053.81 | $2,784.58 | $2,465.36 | $2,136.13 |
| Building returns: | | | | |
| Second year: | | | | |
| $10,400 ÷ 3.5208766* | 2,953.81 | ..... | ..... | ..... |
| Third year: | | | | |
| $2,953.81 × .875 | ..... | 2,584.58 | ..... | ..... |
| Fourth year: | | | | |
| $2,953.81 × .75 | ..... | ..... | 2,215.36 | ..... |
| Fifth year: | | | | |
| $2,953.81 × .625 | ..... | ..... | ..... | 1,846.13 |
| Land returns | $ 100.00 | $ 200.00 | $ 250.00 | $ 290.00 |

* Present worth of 8-year varying annuity, premise 4, 8%, as in Case A (see page 332).

**Evaluation of Leasehold Estate**

| Year of Lease | Total Returns | Rental | Total Leasehold Returns (*a*) | Discount Factor | Present Values |
|---|---|---|---|---|---|
| 2 | $3,053.81 | $400.00 | $2,653.81 | $(1.09)^{-1}$ | $2,434.69 |
| 3 | 2,784.58 | 400.00 | 2,384.58 | $(1.09)^{-2}$ | 2,007.05 |
| 4 | 2,465.36 | 400.00 | 2,065.36 | $(1.09)^{-3}$ | 1,594.84 |
| 5 | 2,136.13 | 400.00 | 1,736.13 | $(1.09)^{-4}$ | 1,229.92 |
| 6 | 1,766.91*b* | 400.00 | 1,366.91 | $(1.09)^{-5}$ | 888.40 |
| 7 | 1,397.68*c* | 400.00 | 997.68 | $(1.09)^{-6}$ | 594.88 |
| Total valuation of leasehold estate . . . . . | | | | | $8,749.78 |

*a*. Since the total leasehold return is less than the building return to owner in fee simple, the leasehold interest in land is valueless and the higher of the leasehold rates is used.
*b*. ($2,953.81 × .50) + $290.00 = $1,766.91.
*c*. ($2,953.81 × .375) + $290.00 = $1,397.68.

## LESSEE'S JOURNAL ENTRIES

**Entry for Erection of Building and First Year's Rental**

| | | |
|---|---|---|
| Leasehold Interest in Building . . . . . | $8,749.78 | |
| Profit and Loss . . . . . | 1,650.22 | |
| Cash . . . . . | | $10,400.00 |

**Annual Entry for Rentals** (2nd to 7th years, inclusive)

| | | |
|---|---|---|
| Rent Expense . . . . . | 400.00 | |
| Cash . . . . . | | 400.00 |

**Entries for Building Returns**

| Year of Lease | Rent Expense Dr. (*a*) | Interest Income Cr. (9%) | Leasehold Interest in Building Cr. | Leasehold Interest in Building Carrying Value |
|---|---|---|---|---|
| 0 | ..... | ..... | ..... | $8,749.78 |
| 2 | $2,653.81 | $787.48 | $1,866.33 | 6,883.45 |
| 3 | 2,384.58 | 619.51 | 1,765.07 | 5,118.38 |
| 4 | 2,065.36 | 460.65 | 1,604.71 | 3,513.67 |
| 5 | 1,736.13 | 316.23 | 1,419.90 | 2,093.77 |
| 6 | 1,366.91 | 188.44 | 1,178.47 | 915.30 |
| 7 | 997.68 | 82.38 | 915.30 | ..... |

*a*. Total returns minus rental, i.e., total leaschold return.

# CHAPTER 11

## Fixed Asset Appraisals

**Definitions.** *Net cost value* of a fixed asset is its cost price minus depreciation based on the cost price. *Sound value* of a fixed asset is its reproduction-new cost minus depreciation based on the reproduction-new cost. *Appreciation* is the excess of the sound value over net cost value. *Devaluation* is the excess of the net cost value over the sound value; i.e., devaluation is negative appreciation. *Cost debit adjustment* is the excess of the depreciation based on cost price that was actually recorded over the depreciation based on cost price that should have been taken; a cost debit adjustment is caused by an increase in the expected life of a fixed asset. *Cost credit adjustment* is the excess of the depreciation based on cost price that should have been taken over the depreciation based on cost price that was actually taken; a cost credit adjustment is caused by a decrease in the expected life of a fixed asset, and it amounts to a negative cost debit adjustment. *Condition per cent* is the percentage the sound value is to the reproduction-new cost (for example, an asset with reproduction-new cost of $10,000 and depreciation based on the reproduction-new cost of $3,000 has a condition per cent of 70). Appreciation in this chapter does not deal with cases in which the value of property may exceed the amount at which it is carried on the books because of an increment due to lapse of time — such as the growth of timber, or the solidification or adaptation of a railway roadbed or of a dam.[1]

**Illustration of an appraisal report.** In order for the reader to have a working knowledge of the type of report which may be prepared for the use of accountants and other interested groups, hypothetical data are presented on pages 352–356.[2]

**Advisability of recording appraisals.** The Committee on Accounting Procedure, American Institute of Accountants,[3] holds the following opinion as to the recording of appreciation:

. . . .

2. . . . any attempt to make property accounts in general reflect current values is both impracticable and inexpedient. Appreciation normally should not be reflected on the books of account of corporations . . .

. . . .

8. The view expressed . . . [above] . . . relates to accounts which form the basis for reports to stockholders and similar statements. Manifestly, there is no objection

[1] This agrees with the handling of appreciation in American Institute of Accountants, *Accounting Research Bulletin No. 5.*

[2] Prepared and used through the courtesy of The American Appraisal Company.

[3] *Accounting Research Bulletin No. 5* (quoted by permission).

THE AMERICAN APPRAISAL COMPANY

HOME OFFICE MILWAUKEE 2, WIS.

INVESTIGATIONS · VALUATIONS · REPORTS

September 19, 1949

Blankton Manufacturing Corp.
Smithville, Wisconsin

Gentlemen:

We have examined certain plant assets exhibited to us as the property of the

BLANKTON MANUFACTURING CORP.
located at Smithville, Wisconsin

for the purpose of expressing an opinion of the sound value of the property as of August 1, 1949.

Our report consists of:

This letter summarizing the results of our investigation.

A summary showing the value of the land and distribution of appraised costs of reproduction new and costs of reproduction less depreciation of the buildings and equipment by classifications of property for each of the respective buildings and outside locations.

A plot plan of the property showing the general location and arrangement of the buildings.

A schedule showing the appraisal numbers and designation of the respective buildings.

An inventory with technical descriptions of the items of property included in the appraisal showing for each item or group of items the appraised cost of reproduction new, percentage of accrued depreciation and cost of reproduction less depreciation.

The property appraised consists of the assets comprised within the classifications stated below and is exclusive of tracings, designs, supplies, materials on hand, or any current or intangible assets.

We have personally inspected the property, investigated the local market conditions, and given consideration to the

Utility and market value of the land,

Cost of Reproduction New of the replaceable property in accordance with current market prices for materials, labor, contractor's overhead and profit and fees, but without consideration to overtime or bonuses for labor and premiums for materials,

Accrued depreciation as evidenced by the observed condition and present and prospective serviceability in comparison with new units of like kind, and

Extent, character and utility of the property.

Our findings are represented by the accompanying summary and inventory which set forth the value of the land and the cost of reproduction less depreciation of the buildings and equipment as follows:

| | |
|---|---|
| Land | $53,000.00 |
| Railroad Siding | 3,351.24 |
| Building Construction and Fixtures | 299,210.60 |
| Furnaces and Ovens | 144,909.52 |
| Machinery and Equipment | 197,500.64 |
| Patterns | 4,290.00 |
| Office Furniture and Fixtures | 7,617.28 |
| GRAND TOTAL - | $709,879.28 |

Therefore, it is our opinion that SEVEN HUNDRED NINE THOUSAND, EIGHT HUNDRED SEVENTY NINE DOLLARS AND TWENTY EIGHT CENTS ($709,879.28) represents the sound value of the property appraised as of August 1, 1949, for continued use as a part of a going concern.

We have made no investigation of and assume no responsibility for title to, or liabilities against, the property appraised.

Respectfully submitted

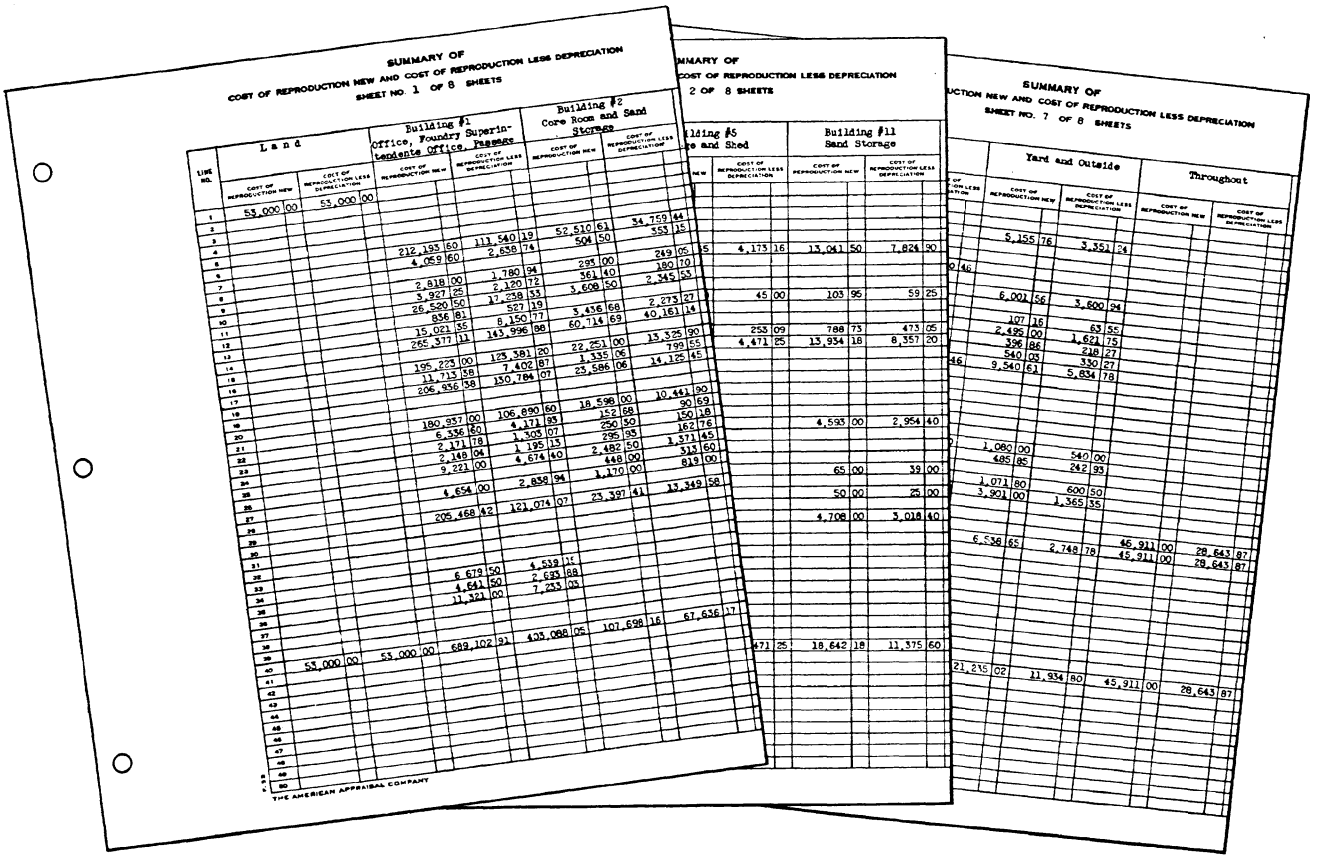
THE AMERICAN APPRAISAL COMPANY

By

F. S. Olson
September 20, 1949

Chairman of the Board

INVESTIGATIONS · VALUATIONS · REPORTS



SUMMARY OF
COST OF REPRODUCTION NEW AND COST OF REPRODUCTION LESS DEPRECIATION
SHEET NO. 1 OF 8 SHEETS

| LINE NO. | Land | | Building #1 Office, Foundry Superintendents Office, Passage | | Building #2 Core Room and Sand Storage | |
|---|---|---|---|---|---|---|
| | COST OF REPRODUCTION NEW | COST OF REPRODUCTION LESS DEPRECIATION | COST OF REPRODUCTION NEW | COST OF REPRODUCTION LESS DEPRECIATION | COST OF REPRODUCTION NEW | COST OF REPRODUCTION LESS DEPRECIATION |
| 1 | 53,000 00 | 53,000 00 | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | 212,195 60 | 111,540 19 | 52,510 61 | 34,759 44 |
| 5 | | | 4,069 60 | 2,658 74 | 504 50 | 553 15 |
| 6 | | | | | | 249 05 |
| 7 | | | 2,818 00 | 1,780 94 | 295 00 | 180 70 |
| 8 | | | 5,927 25 | 2,120 72 | 361 40 | 2,345 55 |
| 9 | | | 26,520 50 | 17,258 33 | 5,608 50 | |
| 10 | | | 856 81 | 527 19 | | |
| 11 | | | 15,021 55 | 8,150 77 | 3,416 68 | 2,273 27 |
| 12 | | | 265,377 11 | 143,996 88 | 60,714 69 | 40,161 14 |
| 13 | | | | | | |
| 14 | | | 195,223 00 | 125,381 20 | 22,251 00 | 13,325 90 |
| 15 | | | 7,402 87 | | 1,335 06 | 799 55 |
| 16 | | | 11,713 58 | | 25,586 06 | 14,125 45 |
| 17 | | | 206,936 58 | 150,784 07 | | |
| 18 | | | | | | 10,461 90 |
| 19 | | | | | 18,598 00 | 90 69 |
| 20 | | | 180,957 00 | 106,890 60 | 152 88 | 150 18 |
| 21 | | | 6,336 80 | 4,171 85 | 250 50 | 162 76 |
| 22 | | | 2,171 18 | 1,305 07 | 295 35 | 1,573 45 |
| 23 | | | 2,148 08 | 1,195 13 | 2,482 50 | 513 60 |
| 24 | | | 9,223 00 | 4,674 40 | 448 00 | 819 00 |
| 25 | | | | | 1,170 00 | |
| 26 | | | 4,654 00 | 2,856 94 | | 13,349 58 |
| 27 | | | 205,468 42 | 121,074 07 | 23,397 41 | |
| 28 | | | | | | |
| 29 | | | | | | |
| 30 | | | | | | |
| 31 | | | | | | |
| 32 | | | 6,679 50 | 4,539 16 | | |
| 33 | | | 4,641 50 | 2,693 88 | | |
| 34 | | | 11,321 00 | 7,233 03 | | |
| 35 | | | | | | |
| 36 | | | | | | |
| 37 | | | | | | |
| 38 | | | | | | 67,636 17 |
| 39 | | | | | | |
| 40 | 53,000 00 | 53,000 00 | 689,102 91 | 435,088 05 | 107,698 16 | |
| 41 | | | | | | |
| 42 | | | | | | |
| 43 | | | | | | |
| 44 | | | | | | |
| 45 | | | | | | |
| 46 | | | | | | |
| 47 | | | | | | |
| 48 | | | | | | |
| 49 | | | | | | |
| 50 | | | | | | |

THE AMERICAN APPRAISAL COMPANY

SUMMARY OF
COST OF REPRODUCTION LESS DEPRECIATION
2 OF 8 SHEETS

| Building #5 ...s and Shed | | Building #11 Sand Storage | |
|---|---|---|---|
| COST OF REPRODUCTION NEW | COST OF REPRODUCTION LESS DEPRECIATION | COST OF REPRODUCTION NEW | COST OF REPRODUCTION LESS DEPRECIATION |
| 4,173 16 | 13,041 50 | 7,824 90 | |
| 45 00 | 103 95 | 59 25 | |
| 253 09 | 788 73 | 473 05 | |
| 4,471 25 | 13,934 18 | 8,357 20 | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | 4,593 00 | 2,954 40 | |
| | | | |
| | 65 00 | 39 00 | |
| | 50 00 | 25 00 | |
| | 4,708 00 | 5,018 40 | |
| | | | |
| | | | |
| | | | |
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| | | | |
| 471 25 | 18,642 18 | 11,375 60 | |

SUMMARY OF
...UCTION NEW AND COST OF REPRODUCTION LESS DEPRECIATION
SHEET NO. 7 OF 8 SHEETS

| ...ON LESS ...ATION | Yard and Outside | | Throughout | |
|---|---|---|---|---|
| | COST OF REPRODUCTION NEW | COST OF REPRODUCTION LESS DEPRECIATION | COST OF REPRODUCTION NEW | COST OF REPRODUCTION LESS DEPRECIATION |
| | 5,155 76 | 3,351 24 | | |
| 0 46 | | | | |
| | 6,001 56 | 3,600 94 | | |
| | 107 16 | 63 55 | | |
| | 2,495 00 | 1,621 75 | | |
| | 336 86 | 218 27 | | |
| 46 | 540 03 | 330 27 | | |
| | 9,540 61 | 5,834 78 | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | 1,080 00 | | | |
| | 495 85 | 540 00 | | |
| | | 242 93 | | |
| | 1,071 80 | | | |
| | 3,901 00 | 600 50 | | |
| | | 1,365 35 | | |
| | | | | |
| | 6,536 65 | 2,748 78 | 46,911 00 | 28,643 87 |
| | | | 45,911 00 | 28,643 87 |
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| | | | | |
| | 21,215 02 | 11,934 80 | 45,911 00 | 28,643 87 |

CONSTRUCTION

BUILDING #18

| | | | | |
|---|---|---|---|---|
| EXCAVATION AND FOUNDATION | | | | |
| Area grading 1'0" av. deep | 95 | $ 2,092 85 | | |
| 2803 cu yds grading | | | | |
| Common brick foundation walls and concrete foundation walls and concrete walls, including interior piers and including wood forms and excavation. | | | | |
| 772 cu yds excavation | | | 2,063 40 | |
| common brickwork | | | 4,681 84 | |
| 9681 cu ft wall forms | | | 4,140 03 | |
| 7431 sq ft wall forms | | | 6,794 40 | |
| 1324 sq ft pier forms | | | 3,536 18 | |
| 6972 | | | $18,599 06 | |

CONSTRUCTION

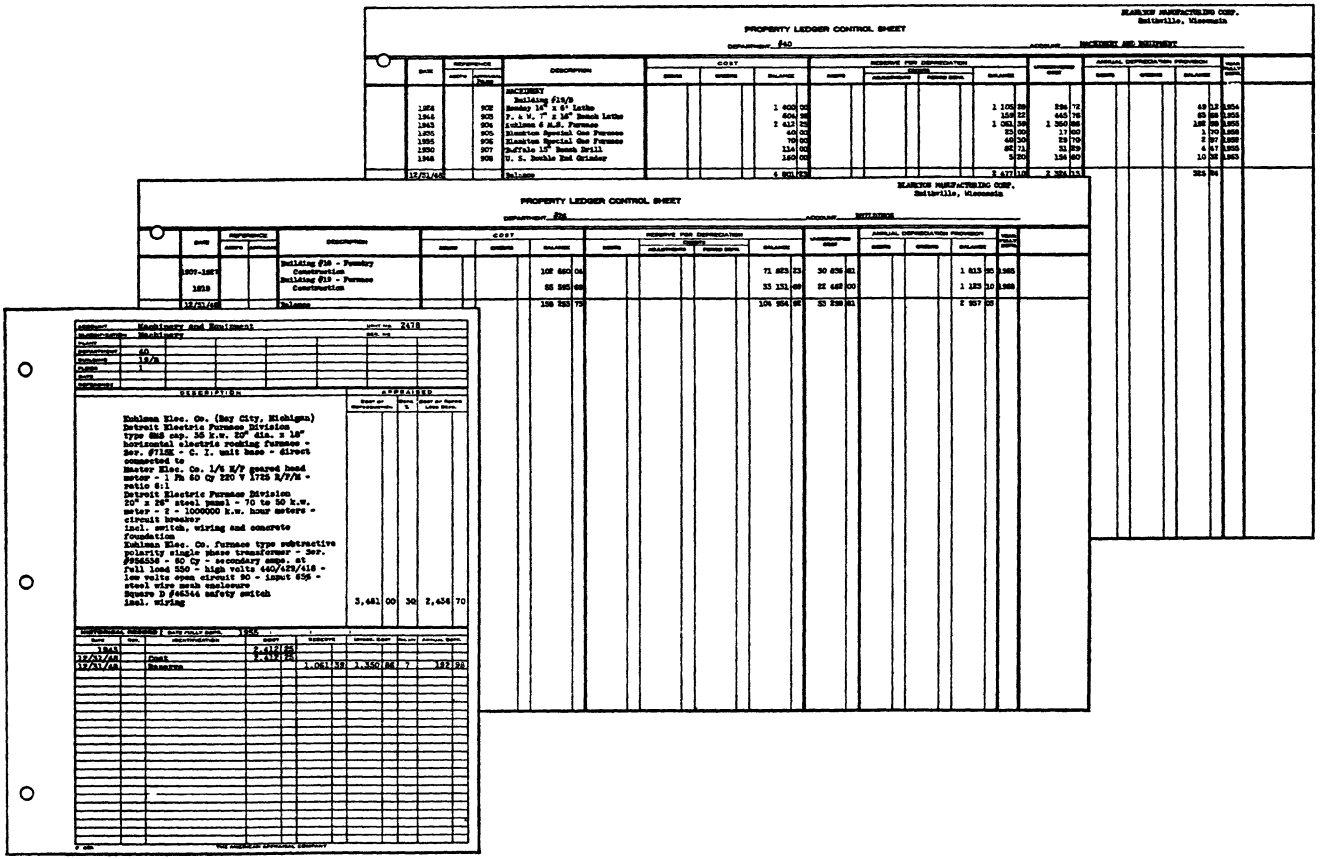
Building #18

| | | | | |
|---|---|---|---|---|
| brick pier and wall | | | | |
| walls with wood | | | | |
| 7" plastered common | | | | |
| ed walls. | | | | |
| tile coping and | | | | |
| l sill painting. | | | | |
| | | | | |
| ch | | 195 50 | $76,383 20 | |
| ing | | 96 | 806 92 | |
| ing | | 75 | 680 80 | |
| ilding | | 63 | 1,193 85 | |
| | | | | |
| indows - | | | | |
| verhead wood | | | | 13,222 00 |
| ss frame, check | | | | $91,612 25 |
| ood sash | | | | |

CONSTRUCTION

Building #18

| | | | | |
|---|---|---|---|---|
| Asphalt | | | | |
| Asbestos-fibre | | | | |
| s | | 13 50 | | 6,858 00 |
| | | 224 50 | | 13,687 00 |
| ormice | | 251 00 | | 6,418 53 |
| on | | 1 15 | | 1,006 10 |
| | | 80 | | 188 00 |
| rapout | | 3 25 | | 227 50 |
| | | | | 334 00 |
| | | | | 16,814 62 |
| | | | | $47,610 64 |



PROPERTY LEDGER CONTROL SHEET

HARNISCHFEGER CORP.
Smithville, Wisconsin

DEPARTMENT 640 ACCOUNT MACHINERY AND EQUIPMENT

| DATE | REFERENCE ASSET | REFERENCE TRANS. | DESCRIPTION | COST DEBITS | COST CREDITS | COST BALANCE | RESERVE FOR DEPRECIATION DEBITS ADJUSTMENTS | RESERVE FOR DEPRECIATION CREDITS PERIOD EXPL. | RESERVE FOR DEPRECIATION BALANCE | UNDEPRECIATED COST | ANNUAL DEPRECIATION PROVISION DEBITS | ANNUAL DEPRECIATION PROVISION CREDITS | ANNUAL DEPRECIATION PROVISION BALANCE | YEARS LIFE REMAIN. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | MACHINERY | | | | | | | | | | | |
| | | | Building #19/B | | | | | | | | | | | |
| 1952 | | 902 | Bemmy 16" x 6' Lathe | | | 1 400 00 | | | 1 105 88 | 294 12 | | | 49 13 | 1954 |
| 1944 | | 903 | T. & W. 7" x 16" Bench Lathe | | | 604 88 | | | 164 22 | 440 66 | | | 69 88 | 1956 |
| 1943 | | 904 | Kuhlman 6 M.S. Furnace | | | 2 413 87 | | | 1 061 39 | 1 350 88 | | | 182 98 | 1956 |
| 1955 | | 905 | Electric Special Ore Furnace | | | 40 00 | | | 22 00 | 18 00 | | | 1 00 | 1958 |
| 1955 | | 906 | Electric Special Ore Furnace | | | 70 00 | | | 40 50 | 29 50 | | | 2 50 | 1958 |
| 1950 | | 907 | Fairfield 15" Bench Drill | | | 114 00 | | | 62 73 | 51 27 | | | 4 47 | 1955 |
| 1948 | | 908 | W. S. Double End Grinder | | | 160 00 | | | 30 00 | 130 00 | | | 10 00 | 1953 |
| | 12/31/48 | | Balance | | | 4 802 75 | | | 1 477 10 | 3 325 65 | | | 325 65 | |

PROPERTY LEDGER CONTROL SHEET

HARNISCHFEGER CORP.
Smithville, Wisconsin

DEPARTMENT 638 ACCOUNT BUILDINGS

| DATE | REFERENCE ASSET | REFERENCE TRANS. | DESCRIPTION | COST DEBITS | COST CREDITS | COST BALANCE | RESERVE FOR DEPRECIATION DEBITS ADJUSTMENTS | RESERVE FOR DEPRECIATION CREDITS PERIOD EXPL. | RESERVE FOR DEPRECIATION BALANCE | UNDEPRECIATED COST | ANNUAL DEPRECIATION PROVISION DEBITS | ANNUAL DEPRECIATION PROVISION CREDITS | ANNUAL DEPRECIATION PROVISION BALANCE | YEARS LIFE REMAIN. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1907-1927 | | | Building #18 - Foundry Construction | | | 102 662 04 | | | 71 823 23 | 30 838 81 | | | 1 813 05 | 1955 |
| 1918 | | | Building #19 - Furnace Construction | | | 56 965 68 | | | 33 151 69 | 23 448 00 | | | 1 123 10 | 1955 |
| | 12/31/48 | | Balance | | | 159 627 72 | | | 104 974 92 | 53 286 81 | | | 2 937 05 | |

ACCOUNT Machinery and Equipment ASSET NO. 2478
NUMBER-NAME Machinery
PLANT
DEPARTMENT 40
BUILDING 19/B
CLASS 1
BAYS
SUBSIDIARY
SERIAL NO.

DESCRIPTION

Kuhlman Elec. Co. (Bay City, Michigan)
Detroit Electric Furnace Division
Type SH3 cap. 35 k.w. 20" dia. x 18" horizontal electric rocking furnace - Ser. #713E - G. I. unit base - direct connected to
Sharer Elec. Co. 1/4 H/P geared head motor - 1 Ph 60 Cy 220 V 1725 R/P/M - ratio 6:1
Detroit Electric Furnace Division
20" x 26" steel panel - 70 to 50 k.w. meter - 2 - 1000000 k.w. hour meters - circuit breaker
incl. switch, wiring and concrete foundation
Kuhlman Elec. Co. furnace type substractive polarity single phase transformer - Ser. #956538 - 60 Cy - secondary amps. at full load 550 - high volts 440/479/416 - low volts open circuit 80 - input 858 - steel wire mesh enclosure
Square D #46344 safety switch
incl. wiring

APPRAISED

| Date of Appraisal | Value | % | Date of Appraisal | Less Depr. |
|---|---|---|---|---|
| | 3,461 | 00 | 30 | 2,456 70 |

| DATE | DEPR. | DATE FULLY DEPR. 1956 IDENTIFICATION | COST | RESERVE | ANNUAL COST | RATE | ANNUAL DEPR. |
|---|---|---|---|---|---|---|---|
| 1943 | | | 2 413 87 | | | | |
| 12/31/48 | | Cost | 2 413 87 | | | | |
| 12/31/48 | | Reserve | | 1 061 39 | 1 350 88 | 7 | 182 98 |

to showing estimated present values, nor to the computation of depreciation on that basis, for internal administrative purposes. A distinction can be made between the internal accounting for an enterprise and the accounting for the corporation which carries on the enterprise. From the standpoint of the enterprise, cost to the corporation is not of controlling significance, but, to the corporation itself, cost is the proper foundation of its accounting.

9. It must be recognized that in many cases appreciation has already been recorded on the books; it seems desirable, if practicable, to develop a standard procedure in such cases. In addition, instances occasionally arise in which appreciation is relatively so large and so well assured that it may be permissible from an accounting standpoint, and desirable upon more general grounds, to record it in the books. It should be added that in many cases the object sought could be better obtained by explanatory notes.

The adjustment for devaluation has not been discussed nearly so much as the adjustment for appreciation. Early writers favored recording devaluation, but not recording appreciation on the grounds of conservatism.[4] With the growth of the importance of the profit and loss statement, accountants expressed the theory that management should not be asked to bear the burden of depreciation based upon high-level costs in times of depression.[5] The Committee on Accounting Procedure, American Institute of Accountants, has not made a pronouncement as to the advisability of recording devaluation. The present authors believe that devaluation should be recorded only when the amounts involved are relatively important.

**Statistics on bases of valuation adopted by business firms.** In order to present to the reader some data as to the methods adopted by business firms in pricing their fixed property on the balance sheets, the following has been taken from a study prepared by the Research Department of the American Institute of Accountants: [6]

While only two changes in the method of valuation of fixed assets were noted during the year in the reports tabulated, the 1947 statistics quoted below include

| 1947 | 1946 | |
|---|---|---|
| 363 | 353 | Cost |
| 27 | 25 | Less than cost |
| 12 | 15 | Book value |
| 67 | 78 | Based on appraisals |
| 20 | 13 | Revalued — no appraisal indicated |
| 73 | 68 | No basis indicated |
| 3 | 2 | Nominal |
| 1 | 13 | Acquisition values, subsequent additions at cost |
| 5 | 5 | Par of securities issued therefor |
| 7 | 4 | Miscellaneous |
| 578 | 576 | |

[4] Greendlinger L., *Financial and Business Statements*, Second Edition (New York: Alexander Hamilton Institute, 1925), p. 317.

[5] (1933) Taylor-Miller, I, 190.

[6] *Accounting Trends in Corporate Reports, 1949*, pp. 33, 35 (quoted by permission).

minor rearrangements of the previous year's classifications as well as differences in degree of disclosure during the two years. Where appraisals or revaluations were mentioned, there was seldom any disclosure as to whether such values were in excess of or lower than cost.

*Descriptive Titles Used*

| | | |
|---|---|---|
| BASED ON APPRAISALS: | | |
| 46 | 71 | Based on appraisal, subsequent additions at cost |
| 13 | 2 | Appraisal or engineer's estimates |
| .. | 1 | Inventories and valuations of independent engineers on basis of 3/1/13 values |
| .. | 2 | Estimated appraisal values plus additions at cost |
| 1 | 1 | Based on appraised sound values in 1927 or prior, discounted approximately 20%, plus subsequent additions at cost and less special write-offs and reserves (General Cable Corp.) |
| 1 | .. | At sound values as appraised as of dates of acquisition, less certain adjustments (National Dairy Products Corp.) |
| 1 | .. | Estimated sound values (Allis-Chalmers Mfg. Co.) |
| 1 | .. | Appraised value of land acquired in exchange for capital stock at organization (Goldblatt Bros., Inc.) |
| 1 | .. | Estimated reproduction cost (1934) (Artloom Corp.) |
| 1 | .. | Appraised at liquidation value (1930), subsequent additions at cost (American Agricultural & Chemical Co.) |
| 1 | 1 | In excess of cost per appraisal (American Republics Corp.) |
| 1 | .. | Written up per 1944 appraisal (Pathé Industries, Inc.) |
| REVALUED — NO APPRAISALS INDICATED: | | |
| 1 | 1 | Estimated sound values or amounts assigned thereto at date of purchase (City Stores Co.) |
| 7 | 1 | At values adjusted to .....; additions at cost (Paramount Pictures Inc.) |
| 1 | 2 | Revalued at prior date (York Corp.) |
| .. | 1 | Values fixed in connection with reorganization of predecessor |
| 1 | 1 | Going concern values as determined by the companies at date of organization and later adjusted (Booth Fisheries Corp.) |
| 1 | 3 | As adjusted by stockholders (P. Lorillard Co.) |
| 4 | 2 | At value fixed by directors (Richfield Oil Corp.) |
| 2 | 1 | As revalued by the management as ....., subsequent additions at cost (Collins & Aikman Corp.) |
| 1 | .. | Difference between cost and underlying net assets applied to assets (Standard Oil Co. — New Jersey) |
| 1 | 1 | At cost except for increased valuations prior to organization of present parent company (Johns-Manville Corp.) |
| 1 | .. | Written up in 1934 (Art Metal Construction Co.) |

**Income tax and appraisals.** The income tax regulations and decisions have had a great effect on depreciation accounting. The main points may be summarized as follows:

1. Retrospective appraisals showing the fair market value of property as of March 1, 1913, or as of other dates, when required for income tax purposes, are generally not accorded great weight when standing alone, but are given some recognition when presented with other evidence.[7]

2. Costs of drawings and patterns erroneously charged to expenses may be capitalized and then depreciated.[8]

3. Revised computation of depreciation for past years is not permitted, unless there is a definite showing that excessive depreciation has been deducted in prior years. An appraisal of property near the end of the useful life does not make such showing.[9]

4. "If it develops that the useful life of the property will be longer or shorter than the useful life as originally estimated under all the known facts, the portion of the cost or other basis of the property not already provided for through depreciation allowances should be spread over the remaining useful life of the property as estimated in the light of the subsequent facts." [10]

5. Treasury Decision 4422,[11] dated February 28, 1934, required that full and complete information with respect to the past history of depreciable property accounts be furnished. Details of the changed depreciation policy were given in Mim. 4170 [12] and I.T. 2838.[13]

6. While the schedules in Mim. 4170 and in Section 29.23 (1)–5, Regulations 111, do not illustrate the deduction for salvage value in determining the depreciation allowance, the salvage value is specially mentioned in Section 29.23 (1)–1, Regulations 111.

**Effects of recording appreciation on income and earned surplus.** As discussed earlier, the question of whether appraisals should be recorded is one to be decided by management, government regulatory agencies, and the accounting profession. But if a positive decision is made, the subsequent treatment of the appraisal accounts is the problem of accountants. One recommended procedure for the original recording of appreciation is to debit a Fixed Asset — Appreciation account, such as Fixed Asset — Gross Appreciation,[14] or Fixed Asset — Adjustment to Replacement Cost,[15] or Fixed Asset — Appraisal Increase,[16] with credit entries to the Reserve for Depreciation — Appreciation account and some types of surplus or proprietorship accounts. Originally, the debit entry and the credit to the Re-

[7] Detailed requirements for such appraisals are given in Mim. 3209, III-2 C.B. 339.
[8] *R. S. Newbold & Son Co.*, 7 B.T.A. 471.
[9] S.R. 2222, IV-1 C.B. 156.
[10] Regulations 69, Art. 165.
[11] XIII-1 C.B. 58.
[12] XIII-1 C.B. 59.
[13] XIII-2 C.B. 133.
[14] (1948) Newlove-Smith-White 126.
[15] (1943) Paton 816.
[16] (1946) Finney, I, 355; (1947) Johnson 345.

serve for Depreciation were made [17] to the ordinary fixed asset accounts, but after Treasury Decision 4422 requiring full disclosure of fixed assets and their related depreciation allowances, the above named accounts began to be advocated.

It is generally understood that the recording of appreciation should be kept out of the Earned Surplus account at the date of the appraisal by crediting such account titles as Revaluation Surplus,[18] or Capital and Surplus Adjustment — Unabsorbed Appreciation,[19] or Surplus from Appraisal of Fixed Assets,[20] or Reserve for Unrealized Appreciation per Appraisal,[21] or Reserve for Unearned Appreciation.[22]

In fact, segregation of the credit arising from revaluation of fixed assets is required by such authorities as the Securities and Exchange Commission,[23] the Uniform Business Corporation Act,[24] and the Treasury Department.[25]

During the years in which interest was predominantly focused on the balance sheet, the periodic amortization of appreciation was recorded by the following entry: [26]

| | | |
|---|---|---|
| Revaluation Surplus . . . . . | $.... | |
| Reserve for Depreciation . . . . . | | $.... |

This entry, of course, keeps amortized appreciation from affecting the income accounts, making a difference in balance sheet amounts only. But as the income statement increased in relative importance, practicing accountants began more and more to charge amortized appreciation against the Profit and Loss account and early writers of the period showed amortized appreciation charged either to Revaluation Surplus or to Profit and Loss.[27] As practice and theory developed on the subject, the later writers stated that amortized appreciation should be charged to Profit and Loss.[28] In fact, many of the later arguments presented for recognition of appreciation in the books are based to a very great extent on the presumption that amortized appreciation must be charged to Profit and Loss. This theory

[17] (1918) Paton-Stevenson 108; (1931) Kohler-Morrison 269.
[18] (1931) Kohler-Morrison 269; (1946) Kester 478; (1942) Holmes 152.
[19] (1943) Paton 816.
[20] (1933) Taylor-Miller, I, 185.
[21] (1946) Finney, I, 348.
[22] (1948) Newlove-Smith-White 126.
[23] Regulations S-X, Rule 5.02, 35.
[24] Uniform Business Corporation Act, Section 25 (II).
[25] Treasury Decision 4422, XIII-1 C.B. 58.
[26] (1921) Montgomery 174; (1923) Saliers 308; (1924) Couchman 205-208; Finney-Baumann, 46 *Journal of Accountancy* 146; Symposium on Appreciation, 5 *Accounting Review* 34-36.
[27] Hull, 2 *Accounting Review* 309; Himmelblau, D., *Advanced Auditing: Financial Investigations* (New York: Ronald Press Co., 1928), L. 6, p. 4; (1931) Kohler-Morrison 355-359; (1933) Taylor-Miller, I, 188; (1934) Finney, I, 294.
[28] (1948) Newlove-Smith-White 132; (1943) Paton 816; (1947) Johnson 346.

was formalized in 1940 when the Committee on Accounting Procedure, American Institute of Accountants [29] stated:

> The committee is of the opinion that when such appreciation has been entered in the books, income should be charged with depreciation computed on the new and higher values. . . . A corporation should not at the same time claim larger property values in its statement of assets, and provide for the amortization of only smaller property sums in its statement of income. . . . The conclusion does not rest upon any basis of narrow logic or precise classification; it is derived from considerations of equity and public policy of the broadest character. These include an application of something analogous to the legal doctrine of estoppel. . . . In the present case this would mean that a company which has made representations as to an increased value of plant cannot afterwards account for depreciation and income as if it had never made such representations.

The Executive Committee, American Accounting Association,[30] stated their view in 1941 thus: ". . . charges for all cost amortization and asset values expired should be by way of the income account."

The questions that confront the accountant once it has been decided to enter appreciation in the books and to charge depreciation on the appraised values are (1) how to treat earned surplus thereafter and (2) what disposition to make of the Revaluation Surplus account. Answers to these questions can be found by answering the following two questions:

1. Should an appraisal be considered as a quasi-reorganization (i.e., giving the firm a fresh start) with the amortizations of the recorded appraised values treated as bona fide cost elements [31] or should a Reserve for Amortized Appreciation in Inventories be established? [32] This latter account is necessary if the quasi-reorganization theory is not used since a portion of the depreciation charged to operations finds its way into the inventory accounts. This means that when depreciation is based on a figure in excess of cost, the periodic balances of work in process and finished goods, on a cost basis, can be objected to on the ground that they include an element of unrealized appreciation.

2. Should Revaluation Surplus be written off to either Earned Surplus or Profit and Loss as the appraised asset is depreciated? This procedure is not followed by those who have the opinion (a) that appraisals practically are quasi-reorganizations and that Revaluation Surplus should be left intact (until disposed of, if at all, by a stock dividend) to show the source

[29] *Accounting Research Bulletin No. 5.*

[30] 16 *Accounting Review* 136. In the 1948 revision of the committee's statement it is stated: "The income of an accounting period should be reported in a statement providing an exhibit of all revenue and expense . . . given accounting recognition during that period." 23 *Accounting Review* 339–344.

[31] The Committee on Accounting Procedure did not consider this point.

[32] Hull, 2 *Accounting Review* 323–324; (1939) Newlove-Smith-White 380–382; (1943) Paton 820; (1947) Langer, Lecture 7, p. 4 (used Excess Depreciation in Inventories account).

of the capital at the date of reorganization; [33] or (b) that since the appraised assets must be replaced by assets purchased at the higher level of prices transfer of Revaluation Surplus would perhaps make such amounts available to be paid out in dividends.[34] The last point may be satisfied by setting up a Reserve for Replacements [35] or by carrying the Appreciation Absorbed account in a special earned surplus account as unavailable for dividends,[36] such as Reserve for Increased Plant Cost.[37]

The fact that the appraised asset is eventually charged to Profit and Loss causes most accountants to write off Revaluation Surplus as the asset is depreciated. This procedure was approved by the Committee on Accounting Procedure, American Institute of Accountants,[38] as follows:

. . . .

14. Assuming this view [carrying to Earned Surplus a portion of Revaluation Surplus account] to be accepted, the questions would remain whether the credit . . . should reach Earned Surplus through Income account or directly, and whether it should be deemed to be a part of free earned surplus or should be regarded as appropriated surplus. If the arguments advanced in paragraph 6 are sound, so that a company which has written up its property values is deemed to be bound to charge income with the depreciation on the larger values represented, it is not proper to undo the effect of such a charge by making a transfer from the revaluation credit to Income account. . . . if the credit is conceded to form a part of earned surplus, it would seem that it should not form the basis of ordinary dividends, but should be regarded as appropriated surplus, or made the basis of dividends specifically described as to the source from which they are paid.

Of course, only amortized cost is deductible for income taxes. If the Appreciation Absorbed account is closed as financial income to Profit and Loss, the net income for the year and the taxable income for the year, as they are affected by depreciation, are identical. As the present authors believe that the imputed costs (interdepartmental profits, interest on investment, amortized appreciation, etc.) should not affect the net income (the net effect of transactions with outsiders), they prefer the income tax procedure to that usually followed by accountants. While some accountants close Appreciation Absorbed directly to Earned Surplus, there is some authority, other than income tax regulations, for closing Appreciation Absorbed to Profit and Loss. This authority [39] wrote:

The availability of a method for charging depreciation to operations for managerial purposes, departmentally and in total, on the basis of a revised plant account, does not relieve the accountant of the *imperative necessity of presenting a final figure of net income which conforms closely with the cost standard throughout.* . . .

[33] (1945) Leland, Ch. 4, p. 11.
[34] Avery, 15 *Accounting Review* 394; (1946) Kester 481.
[35] Hull, 2 *Accounting Review* 324; Symposium on Appreciation, 5 *Accounting Review* 43.
[36] (1927) Baldwin 73–74.
[37] (1943) Paton 818.
[38] *Accounting Research Bulletin No. 5.*
[39] Quoted by permission from (1940) Paton-Littleton 136–137 (emphasis supplied); same treatment in (1943) Paton 816; (1947) Langer, Lecture 7, p. 4 (credited realized appreciation directly to Profit and Loss).

It is important that the so-called current portion of the original capital and surplus adjustment *be not closed directly to earned surplus.* If this is done the income statement does not meet the requirement emphasized above of showing at some point the net income as it would finally appear if the cost basis of reporting had been strictly adhered to. *It is even more objectionable to leave the original adjustment of capital and surplus intact, or to appropriate it as a special surplus reserve,* since such a practice permits the income statement to be prepared and issued with no indication whatever of the way in which the statement has been modified by the revision of plant cost and basis of computing depreciation.

**Journalization of appreciation.** The illustrative problem below concerns a store building rather than a factory building in order to postpone the study of the Reserve for Amortized Appreciation in Inventories (see page 381) and has the estimated service life unchanged in order to postpone the study of cost debit and cost credit adjustments (see page 382).[40]

### *Illustrative Problem No. 1*

### *Appraisal Increase — Estimated Service Life Unchanged*

A store building costing $20,000 on January 1, 1941, had an estimated service life of 50 years. On January 1, 1951, an appraisal determined the reproduction-new cost to be $25,000, remaining life 40 years. Journalize through 1951 if amortized appreciation is charged against income.

*Solution*

| *January 1, 1941* | Income Tax Procedure | | Usual Accounting Procedure | | Quasi-Reorganization Procedure | |
|---|---|---|---|---|---|---|
| Store Building — Cost Price | $20,000 | ..... | $20,000 | ..... | $20,000 | ..... |
| Cash | ..... | $20,000 | ..... | $20,000 | ..... | $20,000 |
| For purchase of the asset. | | | | | | |
| *December 31, 1941 through 1950* | | | | | | |
| Depreciation — Amortized Cost Price | 400 | ..... | 400 | ..... | 400 | ..... |
| Reserve for Depreciation — Cost Price | ..... | 400 | ..... | 400 | ..... | 400 |
| For annual depreciation allowance. | | | | | | |
| Profit and Loss | 400 | ..... | 400 | ..... | 400 | ..... |
| Depreciation — Amortized Cost Price | ..... | 400 | ..... | 400 | ..... | 400 |
| For closing of expenses. | | | | | | |
| Earned Surplus | 400 | ..... | 400 | ..... | 400 | ..... |
| Profit and Loss | ..... | 400 | ..... | 400 | ..... | 400 |
| For closing Profit and Loss. | | | | | | |
| *January 1, 1951* | | | | | | |
| Store Building — Gross Appreciation | 5,000 | ..... | 5,000 | ..... | 5,000 | ..... |
| Reserve for Depreciation — Gross Appreciation | ..... | 1,000 | ..... | 1,000 | ..... | 1,000 |
| Reserve for Unrealized Appreciation | ..... | 4,000 | ..... | 4,000 | ..... | 4,000 |
| For appraisal as follows: | | | | | | |

| | *Per Books* | % | *Per Appraisal* | % | *Difference* |
|---|---|---|---|---|---|
| Recorded | $20,000 | 100 | $25,000 | 100 | $5,000 |
| Depreciated | 4,000 | 20 | 5,000 | 20 | 1,000 |
| Net | $16,000 | 80 | $20,000 | 80 | $4,000 |

[40] The authors wish to acknowledge the editorial work done by Dell Roy King, M.B.A., C.P.A., on the illustrative problems of this chapter.

| *During 1951* | Income Tax Procedure | | Usual Accounting Procedure | | Quasi-Reorganization Procedure | |
|---|---|---|---|---|---|---|
| Depreciation — Amortized Cost Price | $ 400 | | $ 400 | | $ 400 | |
| Depreciation — Amortized Appreciation | 100 | | 100 | | 100 | |
| Reserve for Depreciation — Cost Price | | $ 400 | | $ 400 | | $ 400 |
| Reserve for Depreciation — Gross Appreciation | | 100 | | 100 | | 100 |
| For annual depreciation allowance. | | | | | | |
| Reserve for Unrealized Appreciation | 100 | | 100 | | | |
| Appreciation Absorbed | | 100 | | 100 | | |
| For amortized appreciation absorbed. | | | | | | |
| *December 31, 1951* | | | | | | |
| Profit and Loss | 400 | | 500 | | 500 | |
| Appreciation Absorbed | 100 | | | | | |
| Depreciation — Amortized Cost Price | | 400 | | 400 | | 400 |
| Depreciation — Amortized Appreciation | | 100 | | 100 | | 100 |
| For closing expenses and incomes. | | | | | | |
| Earned Surplus | 400 | | 400 | | 500 | |
| Appreciation Absorbed | | | 100 | | | |
| Profit and Loss | | 400 | | 500 | | 500 |
| For closing Profit and Loss. | | | | | | |
| Earned Surplus | 100 | | 100 | | | |
| Reserve for Unrealized Appreciation | | | | | 100 | |
| Earned Surplus (Unavailable for Dividends) | | 100 | | 100 | | 100 |
| For voluntary earmarking of earned surplus as unavailable for dividends. | | | | | | |

The words "of Store Building" were omitted from the titles of the reserves and expenses in order to save space, but in practice would be added to the account titles. The above procedure obviously contains some entries which may be omitted as they cancel out, but had the asset been a factory asset such omissions could not have been made without affecting the net book value of the inventories. Giving a complete set of entries here makes the effect on the entries of the valuation-budgetary reserves (see page 381) more easily understood. It should be noted that both the income tax and the usual accounting procedures give the same Earned Surplus and Reserve for Unrealized Appreciation although the income tax method gives a different net income balance. The present authors prefer the income tax procedure for reasons given later in this chapter.

**Effect of devaluation on income and earned surplus.** It has long been recognized that in the event of a presumedly permanent decline in value assets may be written down to the prevailing values, but there is no complete agreement as to how this shall be done. The Committee on Accounting Procedure, American Institute of Accountants, holds the opinion [41] that the amounts to be written off, once it has been decided to write down the fixed assets, should be charged first against earned surplus, then capital surplus, and that thereafter the company's accounting should be substan-

[41] *Accounting Research Bulletin No. 3.*

tially similar to that appropriate for a new company. This procedure has also been advanced by other writers,[42] but many believe that the write-down for devaluation should be kept out of the ordinary Earned Surplus at the date of the appraisal by debiting such account titles as Unearned Appreciation,[43] or Capital Adjustment — Revaluation of Assets,[44] or Reduction of Net Worth Due to Revaluation of Fixed Assets,[45] or Capital and Surplus Adjustment — Unabsorbed Declination.[46] Before Treasury Decision 4422, the credit entry was made to the ordinary Fixed Asset account,[47] but now a Fixed Asset — Devaluation account is recommended.[48]

While advocates of the quasi-reorganization theory of appraisals would logically want the proprietorship accounts as of date of appraisal maintained, no pronouncements to that effect are available. Most accountants write off the special proprietorship account established for the devaluation at date of appraisal directly to Earned Surplus as the devalued asset is depreciated;[49] special net worth accounts like Earned Appreciation[50] or Capital Impairment — Revaluation of Assets[51] are sometimes debited instead of Earned Surplus.

Even before the pronouncement in 1940 of *Accounting Research Bulletin No. 5*, depreciation based upon the appraised value of the devalued assets was charged against revenue.[52] While the absorbed devaluation is usually closed directly to Earned Surplus or a similar proprietorship account, the present authors believe that devaluation should be treated like the other imputed costs and that the Devaluation Absorbed account should be closed into Profit and Loss[53] where it would offset Depreciation — Amortized Devaluation; i.e., devaluation should not affect the balances of either Profit and Loss or ordinary Earned Surplus. If the fixed asset is used in a factory, a reserve for Amortized Devaluation in Inventories should be maintained.[54]

**Journalization of devaluation.** The illustrative problem below concerns a store building rather than a factory building in order to postpone the study of the Reserve for Amortized Devaluation in Inventories (see page 381) and has the estimated service life unchanged in order to postpone the study of cost debit and credit adjustments (see page 382). As devaluation is negative appreciation, the account titles recommended parallel those used

[42] (1937) Saliers-Holmes 485; (1942) Rosenkampff-Wider 87; (1940) Kester 486.
[43] (1927) Baldwin 83.
[44] (1940) Paton-Littleton 135–136; Hull, 2 *Accounting Review* 319.
[45] (1933) Taylor-Miller, I, 191.
[46] (1943) Paton 823.
[47] (1927) Baldwin 35; Hull, 2 *Accounting Review* 319; (1933) Taylor-Miller, I, 191.
[48] (1948) Newlove-Smith-White 128; (1943) Paton 823.
[49] (1933) Taylor-Miller, I, 192.
[50] (1927) Baldwin 85.
[51] Hull, 2 *Accounting Review* 320.
[52] (1933) Taylor-Miller, I, 192; (1939) Newlove-Smith-White 288.
[53] See also (1943) Paton 824.
[54] (1939) Newlove-Smith-White 383.

for appreciation as much as possible; the most important exception is the omission of a reserve to accumulate the periodic amortizations of devaluation — such a reserve would have a debit balance so the periodic amortizations are recorded directly in the asset account.

### *Illustrative Problem No. 2*

*Appraisal Decrease — Estimated Service Life Unchanged*

A store building costing $20,000 on January 1, 1941, had an estimated service life of 50 years. On January 1, 1951, an appraisal determined the reproduction-new cost to be $15,000, remaining service life of 40 years. Journalize through 1951 if amortized devaluation is credited to revenue.

*Solution*

| *January 1, 1941* | Income Tax Procedure | | Usual Accounting Procedure | | Quasi-Reorganization Procedure | |
|---|---|---|---|---|---|---|
| Store Building — Cost Price | $20,000 | ..... | $20,000 | ..... | $20,000 | ..... |
| Cash | ..... | $20,000 | ..... | $20,000 | ..... | $20,000 |
| For purchase of asset. | | | | | | |
| *December 31, 1941 through 1950* | | | | | | |
| Depreciation — Amortized Cost Price | 400 | ..... | 400 | ..... | 400 | ..... |
| Reserve for Depreciation — Cost Price | ..... | 400 | ..... | 400 | ..... | 400 |
| For annual depreciation allowance. | | | | | | |
| Profit and Loss | 400 | ..... | 400 | ..... | 400 | ..... |
| Depreciation — Cost Price | ..... | 400 | ..... | 400 | ..... | 400 |
| For closing expenses. | | | | | | |
| Earned Surplus | 400 | ..... | 400 | ..... | 400 | ..... |
| Profit and Loss | ..... | 400 | ..... | 400 | ..... | 400 |
| For closing Profit and Loss. | | | | | | |
| *January 1, 1951* | | | | | | |
| Earned Surplus (Unabsorbed Devaluation) | 4,000 | ..... | 4,000 | ..... | 4,000 | ..... |
| Store Building — Devaluation | ..... | 4,000 | ..... | 4,000 | ..... | 4,000 |
| For appraisal as follows: | | | | | | |

| | *Per Books* | % | *Per Appraisal* | % | *Difference* |
|---|---|---|---|---|---|
| Recorded | $20,000 | 100 | $15,000 | 100 | $5,000 |
| Depreciated | 4,000 | 20 | 3,000 | 20 | 1,000 |
| | $16,000 | 80 | $12,000 | 80 | $4,000 |

| *During 1951* | | | | | | |
|---|---|---|---|---|---|---|
| Depreciation — Amortized Cost Price | 400 | ..... | 400 | ..... | 400 | ..... |
| Store Building — Devaluation | 100 | ..... | 100 | ..... | 100 | ..... |
| Reserve for Depreciation — Cost Price | ..... | 400 | ..... | 400 | ..... | 400 |
| Depreciation — Amortized Devaluation | ..... | 100 | ..... | 100 | ..... | 100 |
| For annual depreciation allowance. | | | | | | |
| Devaluation Absorbed | 100 | ..... | 100 | ..... | ..... | ..... |
| Earned Surplus (Unabsorbed Devaluation) | ..... | 100 | ..... | 100 | ..... | ..... |
| For annual absorption of devaluation. | | | | | | |
| *December 31, 1951* | | | | | | |
| Profit and Loss | 400 | ..... | 300 | ..... | 300 | ..... |
| Depreciation — Amortized Devaluation | 100 | ..... | 100 | ..... | 100 | ..... |
| Devaluation Absorbed | ..... | 100 | ..... | ..... | ..... | ..... |
| Depreciation — Amortized Cost Price | ..... | 400 | ..... | 400 | ..... | 400 |
| For closing expenses and income. | | | | | | |

| *December 31, 1951* | Income Tax Procedure | | Usual Accounting Procedure | | Quasi-Reorganization Procedure | |
|---|---|---|---|---|---|---|
| Earned Surplus | $ 400 | ..... | $ 400 | ..... | $ 300 | ..... |
| Profit and Loss | ..... | $ 400 | ..... | $ 300 | ..... | $ 300 |
| Devaluation Absorbed | ..... | ..... | ..... | 100 | ..... | ..... |
| For closing to Earned Surplus. | | | | | | |
| Earned Surplus | ..... | ..... | ..... | ..... | 100 | ..... |
| Earned Surplus (Unabsorbed Devaluation) | ..... | ..... | ..... | ..... | ..... | 100 |
| For closing absorbed portion of balance. | | | | | | |

The words "of Store Building" were omitted from the titles of some of the accounts in order to save space, but in practice would be added to the account titles. The above procedure obviously contains some entries which may be omitted as they cancel out, but had the asset been a factory asset such omissions could not have been made without affecting the net book value of the inventories on a cost basis. Giving a complete set of entries here makes the effect on the entries of the valuation-budgetary reserves more easily understandable. It should be noted that both the income tax and the ordinary accounting procedures give the same Earned Surplus and Earned Surplus (Unabsorbed Devaluation) balances although they differ on the net income. The present authors prefer the income tax procedure for reasons stated later in this chapter.

**Balance sheet treatment of appraisal accounts.** Regardless of what procedures are adopted for recording or not recording appraisals, the accountant is sure to come in contact with appraisals which have been recorded, and one of his responsibilities is to decide their disposition on the balance sheet. There is general agreement among accountants that (1) the appraisal increase recorded in the special asset accounts less the applicable reserves for depreciation should be shown in the fixed asset section of the balance sheet, (2) the Reserve for Unrealized Appreciation account is a proprietorship item,[55] and (3) the Earned Surplus (Unavailable for Dividends) account is to be listed among the appropriated earned surplus accounts. For example:

December 31, 1951

(Among Fixed Asset Accounts)

| | | |
|---|---|---|
| Fixed Asset — Cost Price | $25,000 | |
| Less Reserve for Depreciation — Cost Price | 5,000 | $20,000 |
| Fixed Asset — Gross Appreciation | $10,000 | |
| Less Reserve for Depreciation — Gross Appreciation | 2,000 | 8,000 |
| (Among Appropriated Earned Surplus Accounts) | | |
| Earned Surplus (Unavailable for Dividends) | | 2,000 |
| (Among Proprietorship Accounts) | | |
| Reserve for Unrealized Appreciation | | 8,000 |

[55] (1948) Newlove-Smith-White 127; (1941) Paton 346; (1946) Finney, I, 347.

There are variations of this procedure advocated by some writers, such as deducting both the Reserve for Unrealized Appreciation account and the Reserve for Depreciation — Gross Appreciation from the asset account on the balance sheet,[56] or adding both the Reserve for Unrealized Appreciation account and the Reserve for Depreciation — Gross Appreciation account to the proprietorship accounts.[57] Some writers [58] show the Reserve for Unrealized Appreciation account among the capital surplus items on the balance sheet rather than as a separate net worth item.

A similar treatment to that recommended for appreciation would be followed with the accounts resulting from a write-down, except by those following the quasi-reorganization theory; the latter write down the original fixed asset account and Earned Surplus account at date of appraisal. The Fixed Asset — Devaluation account would be deducted in the fixed asset section of the balance sheet, and the Earned Surplus — Unabsorbed Devaluation account would be a negative item in the proprietorship section.

**Reappraisal of appraisal.** It is easily seen that no one asset can have both appreciation and devaluation at the same time since the sound value is either above or below the net cost price at any appraisal date. A new appraisal will necessitate adjusting all account balances to the latest determined amounts. Another generally accepted point is that appreciation of one asset does not offset devaluation of another asset in the books of account. Procedures for recording a reappraisal in a simple case are presented in the following illustrative problem.

### *Illustrative Problem No. 3*

### Reappraisal of Appraisal

On January 1, 1953, the store building in Illustrative Problem No. 1 was reappraised. Journalize the entry to adjust the accounts if the reproduction-new cost was found to be $18,000, and if the remaining life was 38 years.

*Solution*

| | Balances before Appraisal Dr.*; Cr. | Balances per Appraisal Dr.*; Cr. | Adjustments Dr.*; Cr. |
|---|---|---|---|
| Store Building — Cost Price | $20,000* | $20,000*a* | ..... |
| Store Building — Gross Appreciation | 5,000* | ..... | $5,000 |
| Reserve for Depreciation — Cost Price | 4,800 | 4,800*a* | ..... |
| Reserve for Depreciation — Gross Appreciation | 1,200 | ..... | 1,200* |

*a.* Unchanged.

[56] (1942) Rosenkampff-Wider 80, 462.
[57] Bennett, 45 *Journal of Accountancy* 438.
[58] Eversole, 12 *Certified Public Accountant* 336; (1938) Sanders-Hatfield-Moore 94.

| | Balances before Appraisal Dr.*; Cr. | Balances per Appraisal Dr.*; Cr. | Adjustments Dr.*; Cr. |
|---|---|---|---|
| Earned Surplus (Unavailable for Dividends) | $ 200*c* | ..... | $ 200* |
| Reserve for Unrealized Appreciation | 3,800 | ..... | 3,800* |
| Cash (included to balance columns) | 20,000 | $20,000*a* | ..... |
| Store Building — Devaluation | ..... | 1,520*b* | 1,520 |
| Earned Surplus (Unabsorbed Devaluation) | ..... | 1,520**b* | 1,520* |
| Earned Surplus (Ordinary) | 5,000* | ..... | 200 |

*a*. Unchanged.
*b*. 38/50 × $2,000 = $1,520.
*c*. Amount transferred from Earned Surplus to Earned Surplus (Unavailable for Dividends) now not required.

**Journal Entry**

| | | |
|---|---|---|
| Reserve for Depreciation — Gross Appreciation | $1,200 | |
| Earned Surplus (Unavailable for Dividends) | 200 | |
| Reserve for Unrealized Appreciation | 3,800 | |
| Earned Surplus (Unabsorbed Devaluation) | 1,520 | |
| Store Building — Gross Appreciation | | $5,000 |
| Store Building — Devaluation | | 1,520 |
| Earned Surplus (Ordinary) | | 200*a* |
| To adjust accounts for reappraisal. | | |

*a*. Instead of crediting the $200 to Earned Surplus (Ordinary), some accountants prefer to credit a special gain account which would be closed to Profit and Loss at the end of the fiscal period.

**Disposal of appreciated fixed asset.** When a fixed asset which has been appreciated is disposed of, the unamortized appreciation must be such that the gain or loss may be closed into Earned Surplus via the Profit and Loss.[59] The entry would be:

| | | |
|---|---|---|
| Cash | $... | |
| Reserve for Depreciation — Cost Price | $... | |
| Reserve for Depreciation — Gross Appreciation | $... | |
| Reserve for Unrealized Appreciation | $... | |
| Fixed Asset — Cost Price | | $... |
| Fixed Asset — Gross Appreciation | | $... |
| Gain on Disposal of Fixed Assets | | $... |

**Conclusions on appreciation and devaluation.** It is not within the sphere of the accounting process to state unequivocally what should be the future attitude toward recording asset appraisals of private enterprises. Public policies in general should be the basis for the financial decision, and accountants should take up the accepted decision from there. At the present time, there have been developed independently in a number of directions many conflicting valuation principles, and many elaborate arguments have been advanced by proponents of each procedure.

As it stands now, with no standard or accepted procedures yet evolved, the authors believe that enterprises should continue to carry their fixed

[59] (1933) Taylor-Miller, I, 193; (1947) Inghram 231–232; (1947) Johnson 351; (1942) Holmes 420; (1947) Langer, Lecture 7, p. 6.

assets at original cost less depreciation, unless the appraisal is recorded in such a way that the final results shown on the financial statements will be the same as obtained under the cost basis. Since accountancy is a recognized profession and accountants have the responsibility to keep it so, there should be reluctance to abandon original cost unless there are substantial changes — increases or decreases — in the relative going concern value of fixed assets. Of course, any abandonment of the cost basis of financial accounting must be accomplished in a clear, fully disclosed way. It is believed that by applying the procedures previously presented under the income tax method, or as it may be called the "compromise treatment," of handling appraisals in cases where costs and values differ materially, accountants can increase their services to private enterprises and the public by presenting more informative data on financial statements.

The points involved in the income tax method which the authors believe are important are:

1. Appraisal of properties is recognized without disturbing the original cost figures.
2. Appraisals are taken up in a series of entries which easily permit omission of such entries to transform the accounts or statements into original cost accounts or statements.
3. The procedure makes for comparison on both original cost and reproduction-new values with other concerns of a similar nature.
4. The new accounts made necessary by the new series of entries are few in number, fully explanatory, and readily understood.
5. Financial statements may be prepared in exactly the same manner as before with only slight elaboration.
6. Amortized imputed costs in inventories are specifically eliminated from final inventories (discussed later in this chapter).
7. Financial statements are more useful to management and the public in that they present more information.
8. There is no danger of paying a dividend which might impair business capital if the voluntary transfer entry of Earned Surplus to Earned Surplus (Unavailable for Dividends) is made.
9. There is no danger that accountants will be accused of concealing data concerning the firm, as all points are adequately disclosed.
10. Income tax reports are easily prepared from the accounts, and income, as affected by depreciation, is identical with taxable income.
11. Governmental regulations of all bodies are adequately followed and fully obeyed.
12. Interpretations of financial statements, as accomplished at present, need only be elaborated slightly to embrace the new accounts and their effects.

13. The procedure helps management determine such things as insurable values, selling prices, and operating efficiency as compared with firms of a similar nature.

**Fixed asset appraisals — adjustments of accumulated depreciation.** *Definitions.* The allowance for depreciation of fixed assets is, at best, a professional estimate based on experience and many determinable facts and presumptions, but nevertheless an estimate. After a number of years of use, an asset may be appraised; as a consequence, it may be found that the depreciation allowance based on original cost has been excessive or perhaps inadequate, or, in other words, the original total estimated life of the fixed asset may not be in agreement with the estimated remaining life as determined by the appraisers. A situation of this nature requires some type of adjustment either in the present Reserve for Depreciation and future allowances, or in future allowances alone, depending on the procedure adopted.

One of the procedures to be presented in this chapter for accomplishing the above mentioned adjustment employs the use of two new accounts which are called (1) Cost Debit Adjustment and (2) Cost Credit Adjustment. Cost Debit Adjustment is the excess of the depreciation based on original cost that was actually recorded in the books over the depreciation based on original cost that should have been taken. Such adjustment is caused by an increase in the estimated service life of a fixed asset. Cost Credit Adjustment is the excess of the depreciation based on original cost that should have been taken over the depreciation that was actually recorded in the books. This adjustment is brought about by a decrease in the estimated service life of a fixed asset, and it is the same as a negative cost debit adjustment.

*Advisability of recording adjustments to service life of fixed assets.* The Committee on Accounting Procedure, American Institute of Accountants,[60] defines depreciation accounting as:

> . . . a system of accounting which aims to distribute the cost or other basic value of tangible capital assets, less salvage (if any), over the estimated useful life of the unit (which may be a group of assets) in a systematic and rational manner. It is a process of allocation, not of valuation.

The Committee holds the following opinion [61] as to making adjustments to accumulated depreciation and future depreciation allowances when the estimated service life of a fixed asset is changed:

. . . .

> 3. . . . under most circumstances, costs once identified and absorbed through amortization or depreciation charges are not considered to be subject to further

[60] *Accounting Research Bulletin No. 22* (quoted by permission).
[61] *Accounting Research Bulletin No. 27* (quoted by permission).

accounting, and corrections of estimates affecting the allocations are commonly reflected in revised charges during the remaining life of the property.

4. . . . underestimates of the useful lives of some assets are frequently found to be offset, in whole or in part, by overestimates of the lives of others, so that in the annual operating results no material or significant change would be effected by a restatement.

. . . .

6. . . . In general, useful financial statements are not achieved by an understatement or an overstatement of asset carrying value which is to be accompanied by an overstatement or understatement of future income because of materially excessive or deficient prior allocations of costs.

. . . .

9. The committee wishes to emphasize the fact that it does not favor an adjustment of the accumulated amortization or depreciation in cases in which such an adjustment would not have a substantial effect upon the representations that will be made in future financial statements. However, it does believe that in cases in which the effect on future financial statements resulting from such an adjustment would be clearly significant, an adjustment of the accumulated amortization or depreciation of the cost of the facilities will provide more useful financial statements.

There are many accountants [62] who insist that adjustments of accumulated depreciation allowances should be made in the books for financial accounting purposes when it is determined that the estimated service life of a fixed asset has changed materially for any reason. The theory behind such an opinion is that future period revenues will not be associated with applicable expenses if some adjustment is not made and the resulting income will be misstated.

Although there is some opinion within the accounting profession that an adjustment of accumulated depreciation allowances should be made, income tax regulations do not take the same position. They [63] provide that in cases where the useful life of fixed assets is determined to be longer or shorter than the useful life as originally estimated under all known facts, the portion of the cost or other basis of the fixed asset not already provided for through depreciation allowances should be spread over the remaining useful life of the fixed asset as estimated in the light of all subsequent facts. However, revised computation of depreciation for past years is permitted in some few cases where there is a definite showing that excessive depreciation has been taken in prior years. A mere opinion or an appraisal near the end of the useful life of the property does not make such a definite showing though.[64] Another permissible adjustment is that costs of pat-

[62] (1931) Sherwood 170; (1934) Finney, I, 290; (1948) Newlove-Smith-White 150; (1942) Rosenkampff-Wider 73; Paton, 81 *Journal of Accountancy* 198; (1946) Kester 477; Mason, P., *Fundamentals of Accounting*, Second Edition (Brooklyn: Foundation Press, 1947), p. 326; (1949) Karrenbrock-Simons, I, 238.

[63] Regulations 69, Art. 165.

[64] S. R. 2222, IV-1 C.B. 156.

terns and drawings erroneously charged to expense may be capitalized and then depreciated.[65] Many depreciation allowance reforms came as a result of the issuance of Treasury Decision 4422,[66] dated February 28, 1934, which required that full and complete information with respect to the past history of depreciable property accounts be furnished. Details of the changed depreciation policy were given in Mim. 4170[67] and I.T. 2838.[68]

Some writers disregard the theory behind the adjustment and recommend the income tax procedure as the proper one to follow just because it conforms to the legal requirements.[69] But many accountants object to the income tax method because they believe that from a financial accounting point of view there is an inequitable distribution of charges on a year-to-year basis.[70]

In setting forth the pros and cons for recording adjustments of accumulated depreciation allowances, Borth [71] brings out that:

> . . . once the depreciation rate has been set, most authorities emphasize the desirability, if not the necessity, of a periodic testing of such rates. The assumed normalcy of operating conditions, intensity of operations, repair policy, and progress in the arts is but a fleeting phenomenon. Even the estimated salvage value is subject to the vagaries of succeeding economic and technological influence. Authorities do not view the subsequent review of depreciation rates as an appraisal procedure. They are careful to emphasize that correction of cost allocations differs essentially from the recognition of price level changes in accounts. . . . One compelling reason for the retroactive adjustment of depreciation and the restoration of fully depreciated fixed assets to the books is the attainment of a standard of significance to the income of the periods — of the past as well as the future. The forward (income tax) method of adjustment rejects corrections of the past, but condones misstatements in future reporting of income.

On the other side of the question, Kohler [72] takes a different view of the problem by stating:

> In short, once the content of a financial statement has been established through the processes of usual preparation and an intelligent unqualified audit, it should stand for all time.

Still another writer [73] advocates making an adjustment when too little depreciation has been taken in the past, but making no correction when overestimates have been made. The last point is supported on the basis of conservatism.

*Effects of recording increase in service life on income and surplus.* In mak-

[65] *R. S. Newbold & Son Co.*, 7 B.T.A. 471.
[66] XIII-1 C.B. 58.
[67] XIII-1 C.B. 59.
[68] XIII-2 C.B. 133.
[69] (1932) Streightoff 89; (1932) Altschuler 109.
[70] (1941) Paton 343.
[71] Borth, 85 *Journal of Accountancy* 471–472.
[72] Kohler, 22 *Accounting Review* 202; see also Kelley, 23 *Accounting Review* 148–153.
[73] Cranstoun, in (1945) Leland, Ch. 7, p. 12.

ing adjustments to depreciation allowances and future depreciation rates for increases in service lives of fixed assets, Earned Surplus is usually credited,[74] although Baldwin [75] credited Unearned Appreciation. The offsetting debit was originally made to the Reserve for Depreciation account [76] with the exceptions of Baldwin [77] who debited the Cost Depreciation Adjustment account and Hull [78] who debited the Depreciation Reserve Adjustment — Cost account. After the pronouncement of Treasury Decision 4422, the Cost Debit Adjustment account [79] was used in order to differentiate between debit and credit adjustments for changes in the expected life of fixed assets. The current depreciation based upon the debit adjustment to the recorded cost value of the fixed asset as per the appraisal is practically always credited to the account receiving the debit at date of appraisal;[80] the debit entry is usually to Depreciation Expense,[81] although separate accounts may be maintained to differentiate between the taxable deduction and nontaxable deduction elements.[82] While the use of the Reserve for Amortized Cost Debit Adjustment in Inventories is usually ignored, its maintenance is recommended in order that the correct book valuation of the inventories may be available for income tax purposes.[83] The present authors believe the Reserve for Amortized Cost Debit Adjustment in Inventories should be maintained because the write-up at date of appraisal is kept out of income, and consistency demands that the amortized adjustment should have no *final* effect on income (debit and credit entries counteract each other with use of reserve).

**Journalization of adjustment in cost caused by increase in service life.** The illustrative problem below concerns a nonfactory fixed asset rather than a factory fixed asset in order to postpone the study of the Reserve for Amortized Cost Debit Adjustment in Inventories (see page 382).

*Illustrative Problem No. 4*

An auto delivery truck costing $1,800 on January 1, 1950, service life originally set at 3 years, had its total service life set at 4 years on January 1, 1951. Give all entries involved.

[74] Finney-Baumann, 46 *Journal of Accountancy* 144–146; Hull, 2 *Accounting Review* 314–318; (1933) Taylor-Miller, I, 184; (1934) Finney, I, 290; (1948) Newlove-Smith-White 151; (1942) Rosenkampff-Wider 73; Paton, 81 *Journal of Accountancy* 198; (1946) Kester 477; (1942) Holmes 412.

[75] (1927) Baldwin 83, 103–104.

[76] Finney-Baumann, 46 *Journal of Accountancy* 144–146; (1931) Sherwood 170; (1932) Streightoff 89; (1933) Taylor-Miller, I, 184; (1934) Finney, I, 290; (1947) Johnson 295; (1942) Holmes 412.

[77] (1927) Baldwin 83.

[78] Hull, 2 *Accounting Review* 314–318.

[79] (1948) Newlove-Smith-White 151; the debit to Reserve for Depreciation is still recommended by (1941) Paton 342; (1946) Kester 477; 1946 Finney, I, 349.

[80] Hull, 2 *Accounting Review* 314–318; (1933) Taylor-Miller, I, 184–185.

[81] Hull, 2 *Accounting Review* 314–318; (1933) Taylor-Miller, I, 184–185.

[82] (1948) Newlove-Smith-White 151.

[83] (1939) Newlove-Smith-White 382.

## *Solution*

| | Income Tax Procedure | | Usual Accounting Procedure | | Quasi-Reorganization Procedure | |
|---|---|---|---|---|---|---|
| *January 1, 1950* | | | | | | |
| Auto Delivery Truck — Cost Price | $1,800 | ..... | $1,800 | ..... | $1,800 | ..... |
| Cash | ..... | $1,800 | ..... | $1,800 | ..... | $1,800 |
| For purchase of asset. | | | | | | |
| *During 1950* | | | | | | |
| Depreciation — Amortized Cost Price | 600 | ..... | 600 | ..... | 600 | ..... |
| Reserve for Depreciation — Cost Price | ..... | 600 | ..... | 600 | ..... | 600 |
| For annual depreciation allowance. | | | | | | |
| *December 31, 1950* | | | | | | |
| Profit and Loss | 600 | ..... | 600 | ..... | 600 | ..... |
| Depreciation — Amortized Cost Price | ..... | 600 | ..... | 600 | ..... | 600 |
| For closing expenses. | | | | | | |
| Earned Surplus | 600 | ..... | 600 | ..... | 600 | ..... |
| Profit and Loss | ..... | 600 | ..... | 600 | ..... | 600 |
| For closing Profit and Loss. | | | | | | |
| *January 1, 1951* | | | | | | |
| Auto Delivery Truck — Cost Debit Adjustment | 150 | ..... | 150 | ..... | 150 | ..... |
| Earned Surplus (or Excess Depreciation Recorded) | ..... | 150 | ..... | 150 | ..... | 150 |
| To adjust for change in life expectancy: | | | | | | |
| Depreciation taken ($\frac{1}{4} \times \$1,800$) $600 | | | | | | |
| Corrected depreciation ($\frac{1}{3} \times \$1,800$) 450 | | | | | | |
| Adjustment $150 | | | | | | |
| *During 1951, 1952, and 1953* (Made in 3 equal installments) | | | | | | |
| Depreciation — Amortized Cost Price (taxable deduction) | 1,200 | ..... | 1,200 | ..... | 1,200 | ..... |
| Depreciation — Amortized Cost Debit Adjustment (nontaxable deduction) | 150 | ..... | 150 | ..... | 150 | ..... |
| Reserve for Depreciation — Cost Price | ..... | 1,200 | ..... | 1,200 | ..... | 1,200 |
| Auto Delivery Truck — Cost Debit Adjustment | ..... | 150 | ..... | 150 | ..... | 150 |
| For annual depreciation allowances, as follows: | | | | | | |
| Cost Price: $\frac{1}{4} \times (\$1,800 - \$600) = \$400$ | | | | | | |
| Cost Debit Adjustment: $\frac{1}{4} \times \$150 = \$50$ | | | | | | |
| Earned Surplus | 150 | ..... | 150 | ..... | ..... | ..... |
| Cost Debit Adjustment Absorbed | ..... | 150 | ..... | 150 | ..... | ..... |
| For annual absorption of cost debit adjustment. | | | | | | |
| *December 31, 1951, 1952, and 1953* (Made in 3 equal installments) | | | | | | |
| Profit and Loss | 1,200 | ..... | 1,350 | ..... | 1,350 | ..... |
| Cost Debit Adjustment Absorbed | 150 | ..... | ..... | ..... | ..... | ..... |
| Depreciation — Amortized Cost Price | ..... | 1,200 | ..... | 1,200 | ..... | 1,200 |
| Depreciation — Amortized Cost Debit Adjustment | ..... | 150 | ..... | 150 | ..... | 150 |
| For closing expenses and income. | | | | | | |
| Earned Surplus | 1,200 | ..... | 1,200 | ..... | 1,350 | ..... |
| Cost Debit Adjustment Absorbed | ..... | ..... | 150 | ..... | ..... | ..... |
| Profit and Loss | ..... | 1,200 | ..... | 1,350 | ..... | 1,350 |
| For closing to Earned Surplus. | | | | | | |
| *January 1, 1954* | | | | | | |
| Reserve for Depreciation — Cost Price | 1,800 | ..... | 1,800 | ..... | 1,800 | ..... |
| Auto Delivery Truck — Cost Price | ..... | 1,800 | ..... | 1,800 | ..... | 1,800 |
| For scrapping of the asset. | | | | | | |

It should be noted that all three procedures give the same final results as to Earned Surplus, although differing on the net income balance. The complete set of journal entries was given above in order to make easier the study of the entries when the valuation-budgetary reserves (see page 381) are involved. Most likely the entries establishing and closing the Cost Debit Adjustment Absorbed account would be ignored (as they are under the quasi-reorganization procedure) under the usual accounting procedure if the fixed asset is a nonfactory asset, but they cannot be ignored, if the fixed asset is a factory asset, without affecting the net book value of the inventories. The present authors prefer the income tax procedure for reasons given later in this chapter.

**Effect of decrease in service life on income and earned surplus.** When an appraisal shows that too long an estimated service life of a fixed asset has been used in the past, the correction entry nearly always debits Earned Surplus,[84] although Baldwin debits Unearned Appreciation.[85] Usually the offsetting credit is to Reserve for Depreciation,[86] although occasionally such accounts as Cost Depreciation Adjustment [87] or Cost Credit Adjustment [88] are credited. The current depreciation based upon the credit adjustment to the recorded cost value of the fixed asset as per appraisal is practically always debited to the account receiving the credit at date of appraisal,[89] the credit entry is usually to Depreciation Expense,[90] although separate accounts may be maintained to differentiate between the taxable and nontaxable elements.[91] While the use of the Reserve for Amortized Cost Credit Adjustment in Inventories has been recommended because of the income tax regulations,[92] the present authors believe that the reserve should be maintained because the write-down at date of appraisal is not recorded as a charge to income, and consistency demands that the amortized adjustment should have no *final* effect on income (debit and credit entries counteract each other with use of reserve).

**Journalization of adjustment in cost caused by decrease in service life.** The illustrative problem below concerns a nonfactory fixed asset rather than a factory fixed asset in order to postpone the study of the Reserve for Amortized Cost Credit Adjustment in Inventories (see page 382).

[84] (1933) Taylor-Miller, I, 185; (1934) Finney, I, 291; (1948) Newlove-Smith-White 151; Avery, 15 *Accounting Review* 397; (1941) Paton 342; (1946) Kester 477; (1942) Holmes 413.

[85] (1927) Baldwin 107–110.

[86] (1933) Taylor-Miller, I, 185; (1934) Finney, I, 291; Avery, 15 *Accounting Review* 397; (1942) Holmes 413.

[87] (1927) Baldwin 107–110.

[88] (1948) Newlove-Smith-White 151.

[89] (1933) Taylor-Miller, I, 291; (1948) Newlove-Smith-White 151.

[90] (1933) Taylor-Miller, I, 291; Avery, 15 *Accounting Review* 397 (his offsetting entry is to ordinary depreciation reserve).

[91] (1948) Newlove-Smith-White 151.

[92] (1939) Newlove-Smith-White 385–386.

*Illustrative Problem No. 5*

An auto service truck costing $1,800 on January 1, 1952, service life originally set at 3 years, had its total service life set at 2 years on January 1, 1953. Give all entries involved.

*Solution*

| | Income Tax Procedure | | Usual Accounting Procedure | | Quasi-Reorganization Procedure | |
|---|---|---|---|---|---|---|
| *January 1, 1952* | | | | | | |
| Auto Delivery Truck — Cost Price | $1,800 | ..... | $1,800 | ..... | $1,800 | ..... |
| Cash | ..... | $1,800 | ..... | $1,800 | ..... | $1,800 |
| For purchase of asset. | | | | | | |
| *During 1952* | | | | | | |
| Depreciation — Amortized Cost Price | 600 | ..... | 600 | ..... | 600 | ..... |
| Reserve for Depreciation — Cost Price | ..... | 600 | ..... | 600 | ..... | 600 |
| For annual depreciation allowance. | | | | | | |
| *December 31, 1952* | | | | | | |
| Profit and Loss | 600 | ..... | 600 | ..... | 600 | ..... |
| Depreciation — Amortized Cost Price | ..... | 600 | ..... | 600 | ..... | 600 |
| For closing expenses. | | | | | | |
| Earned Surplus | 600 | ..... | 600 | ..... | 600 | ..... |
| Profit and Loss | ..... | 600 | ..... | 600 | ..... | 600 |
| For closing to Earned Surplus. | | | | | | |
| *January 1, 1953* | | | | | | |
| Earned Surplus (or Insufficient Depreciation Recorded) | 300 | ..... | 300 | ..... | 300 | ..... |
| Auto Delivery Truck — Cost Credit Adjustment | ..... | 300 | ..... | 300 | ..... | 300 |
| To adjust for change in life expectancy: | | | | | | |
| Corrected depreciation (½ × $1,800) | $900 | | | | | |
| Depreciation taken (½ × $1,800) | 600 | | | | | |
| Adjustment | $300 | | | | | |
| *During 1953* | | | | | | |
| Depreciation — Amortized Cost Price (taxable deduction) | 1,200 | ..... | 1,200 | ..... | 1,200 | ..... |
| Auto Delivery Truck — Cost Credit Adjustment | 300 | ..... | 300 | ..... | 300 | ..... |
| Reserve for Depreciation — Cost Price | ..... | 1,200 | ..... | 1,200 | ..... | 1,200 |
| Depreciation — Amortized Cost Credit Adjustment (nontaxable item) | ..... | 300 | ..... | 300 | ..... | 300 |
| For annual depreciation allowances. | | | | | | |
| Cost Credit Adjustment Absorbed | 300 | ..... | 300 | ..... | ..... | ..... |
| Earned Surplus | ..... | 300 | ..... | 300 | ..... | ..... |
| For annual absorption of cost credit adjustment. | | | | | | |
| *December 31, 1953* | | | | | | |
| Profit and Loss | 1,200 | ..... | 900 | ..... | 900 | ..... |
| Depreciation — Amortized Cost Credit Adjustment | 300 | ..... | 300 | ..... | 300 | ..... |
| Depreciation — Amortized Cost Price | ..... | 1,200 | ..... | 1,200 | ..... | 1,200 |
| Cost Credit Adjustment Absorbed | ..... | 300 | ..... | ..... | ..... | ..... |
| To close expenses and incomes. | | | | | | |
| Earned Surplus | 1,200 | ..... | 1,200 | ..... | 900 | ..... |
| Profit and Loss | ..... | 1,200 | ..... | 900 | ..... | 900 |
| Cost Credit Adjustment Absorbed | ..... | ..... | ..... | 300 | ..... | ..... |
| To close to Earned Surplus. | | | | | | |
| *January 1, 1954* | | | | | | |
| Reserve for Depreciation — Cost Price | 1,800 | ..... | 1,800 | ..... | 1,800 | ..... |
| Auto Delivery Truck — Cost Price | ..... | 1,800 | ..... | 1,800 | ..... | 1,800 |
| For scrapping of asset. | | | | | | |

All procedures give identical Earned Surplus balances although they differ as to net income balances. The above entries can be simplified if the fixed asset involved is a nonfactory asset, but the whole set is needed if the fixed asset is a factory asset, as then the use of the Reserve for Amortized Cost Credit Adjustment in Inventories account (see page 382) is required to ascertain correctly the net book value of the inventories; the entries for that reserve can be inserted in the foregoing entries without serious complications. The present authors prefer the income tax procedure for reasons stated later in this chapter.

**Entries for second revision of service life.** At the date of each appraisal, the balances before that appraisal must be adjusted to the balances authorized by that appraisal.

*Illustrative Problem No. 6*

On January 1, 1952, the auto delivery truck in Illustrative Problem No. 4 was reappraised. Journalize if the second appraisal gave the replacement-new cost as $1,600 and the remaining life as 6 months.

*Solution*

| | Balances before Appraisal Dr.*; Cr. | Balances per Appraisal Dr.*; Cr. | Adjustments Dr.*; Cr. |
|---|---|---|---|
| Auto Delivery Truck — Cost Price | $1,800* | $1,800*a* | ..... |
| Auto Delivery Truck — Cost Debit Adjustment | 100* | ..... | $100 |
| Reserve for Depreciation — Cost Price | 1,000 | 1,000*a* | ..... |
| Earned Surplus | 900* | 1,480**d* | 580* |
| Cash (included to balance columns) | 1,800 | 1,800*a* | ..... |
| Auto Delivery Truck — Devaluation | ..... | 40*b* | 40 |
| Auto Delivery Truck — Cost Credit Adjustment | ..... | 440*c* | 440 |

*a*. Not changed.
*b*. 6/30 × ($1,800 − $1,600) = $40.
*c*. (24/30 × $1,800) − $1,000 = $440.
*d*. Balancing figure.

**Journal Entry**

| | | |
|---|---|---|
| Earned Surplus | $580*a* | |
| Auto Delivery Truck — Cost Debit Adjustment | | $100 |
| Auto Delivery Truck — Devaluation | | 40 |
| Auto Delivery Truck — Cost Credit Adjustment | | 440 |
| For second appraisal. | | |

*a*. Instead of debiting Earned Surplus with $580, some accountants prefer to debit a special expense account which would be closed to Profit and Loss at the end of the fiscal period.

**Balance sheet treatment of adjustments to service life.** There is no problem of balance sheet presentation of adjustments of changes in accumulated depreciation if the usual accounting methods of recording such adjustments are followed, as all changes are made in the ordinary accounts.

If new accounts are introduced into the books, there need be no changes in fixed asset presentation on balance sheets; only slight elaboration is called for. The Cost Debit Adjustment would be added to the fixed asset whose service life was changed and the Cost Credit Adjustment would be deducted, in the same manner as the ordinary Reserve for Depreciation account, from the respective fixed asset on the balance sheet, for example:

December 31, 1953
(Among Fixed Asset Accounts)

| | | |
|---|---|---|
| Fixed Asset — Cost Price | $25,000 | |
| Less Reserve for Depreciation — Cost Price | 5,000 | |
| | $20,000 | |
| Fixed Asset — Cost Debit Adjustment | 2,000 | $22,000 |

**Conclusions as to changes in service life.** It is the opinion of the authors that adjustments should be made in the books for changes in estimated service life of fixed assets when such changes would materially affect the financial statements prepared from the books. Without taking due cognizance of such adjustments, there will not be reasonable association of expenses and revenues in the income statement nor full disclosure in the balance sheet. Accountants should strive to make their statements present fully and accurately the facts of the situation.

The authors also believe that accountants should strive to present statements which regulatory agencies will accept. It is admitted that accounting standards and regulations are in conflict on several points, but the accountant should strive to develop procedures which will present both views in one set of financial statements, i.e., not keep separate accounts for, say, income tax purposes and another set of accounts for financial accounting purposes. Of course, the ultimate goal should be to try to influence legislation in a constructive manner in order to try to get the regulatory agencies to adopt the accounting standards.

With the above points in mind, the authors prefer the method of recording adjustments in accumulated depreciation allowances and future provisions for depreciation heretofore presented under the "income tax procedure". This procedure is recommended for the following reasons:

1. Adjustments are accomplished without disturbing the original cost figures.
2. The new accounts made necessary by the new series of entries are few in number, fully explanatory, and easily understood.
3. Income tax reports may be easily prepared from the accounts, and income, as affected by depreciation, is identical with taxable income.
4. Financial statements may be prepared as in the past, with only slight elaboration.

5. Amortized imputed costs are specifically eliminated from final inventories (discussed later in this chapter).

6. Governmental regulations are adequately followed and full disclosure made.

7. Interpretations of financial statements as carried out at present need only be elaborated slightly to embrace the new accounts and their effects.

8. There is a reasonable association of expenses and revenues, as affected by depreciation, with an offsetting entry to make the statements conform to income tax regulations.

9. The dual account procedure helps management, to some extent, to determine such things as insurable values, selling prices, and operating efficiency as compared with firms of a similar nature.

**Depreciation of war emergency facilities.** The following excerpts taken by permission from *Accounting Research Bulletin No. 27* present an interesting problem in the accounting for depreciation:

1. During the war period, many companies acquired productive facilities under certificates of necessity issued pursuant to Section 124 of the Internal Revenue Code. These certificates, covering "emergency facilities" considered essential to the war effort, permitted the owner of the facilities to amortize their cost for income tax purposes over a period of 60 months, or, under certain conditions, over a shorter period. . . .

2. The financial statements of industrial companies issued during the war period show that many companies acquiring emergency facilities depreciated or amortized their costs at rates permitted for tax purposes. . . . the committee has concluded that the conventions and practices of accounting for productive assets under ordinary business and economic conditions are not wholly applicable to these problems, and that special adjustments of past accounting for emergency facilities may in some cases make possible the preparation of more useful and significant financial statements.

. . . .

7. It is the opinion of the committee that where the facts clearly indicate that the accelerated amortization or depreciation of emergency facilities at rates permitted for tax purposes has resulted in a carrying value materially less than that reasonably chargeable to revenues to be derived from the continued use of the facilities and where such difference would have a significant effect upon the financial statements, the adjustment of accumulated amortization or depreciation of such facilities is appropriate. The committee recognizes that in the determination of the usefulness and worth of such facilities it will be necessary to consider their adaptability to peacetime use, the effect of their use upon effective utilization of other facilities, the possibilities of an inflated initial cost, and the fact that no tax deductions for amortization or depreciation will be allowable in future years. Consideration of these factors, the committee believes, will usually result in the determination of a carrying value for emergency facilities less than the cost of the facility reduced by the depreciation that would have been appropriate had no certificate of necessity been involved.

As *Accounting Research Bulletin No. 27* does not give any details for the accounts to be used with war emergency facilities, the present authors recommend that war emergency facilities be considered as extreme illustrations of fixed assets involving cost debit adjustments; this may readily be done by substituting "emergency facilities adjustment" in lieu of "cost debit adjustment" in the hyphenated accounts.

**Valuation-budgetary reserves and appraisals.** While accountants who believe that appraisals amount to quasi-reorganizations, logically should consider that the amortized portions for appraisal adjustments are legitimate costs, all other accountants to be consistent must hold that amortized appreciation and amortized devaluation are not to be allowed to affect inventory valuations. The question of whether or not amortized cost debit and credit adjustments should affect inventory valuations is debatable, but the present authors prefer to prevent the accounting for appraisals from affecting the inventory valuations by maintaining the necessary valuation-budgetary reserves (see pages 167–169).

*Journal entries.* The valuation-budgetary reserves are established in lieu of the entry setting up the Appreciation Absorbed account or the Devaluation Absorbed account, or the Cost Debit Adjustment Absorbed account or the Cost Credit Adjustment Absorbed account. After the Cost of Goods Sold account has been established, the valuation-budgetary reserves must be reduced to a balance equaling the imputed costs in the final inventory. The contrasting journal entries for a factory and store building are:

| | For store building | | For factory building | |
|---|---|---|---|---|
| *Appreciation* | | | | |
| Revaluation Surplus | $xxx | .... | $xxx | .... |
| Appreciation Absorbed | .... | $xxx | .... | .... |
| Reserve for Amortized Appreciation in Inventories | .... | .... | .... | $xxx |
| For amortized appreciation for period. | | | | |
| Reserve for Amortized Appreciation in Inventories | .... | .... | $xxx | .... |
| Appreciation Absorbed | .... | .... | .... | $xxx |
| For amortized appreciation in Cost of Goods Sold account. | | | | |
| *Devaluation* | | | | |
| Devaluation Absorbed | $xxx | .... | .... | .... |
| Reserve for Amortized Devaluation in Inventories | .... | .... | $xxx | .... |
| Earned Surplus (Unabsorbed Devaluation) | .... | $xxx | .... | $xxx |
| For amortized devaluation for period. | | | | |
| Devaluation Absorbed | .... | .... | $xxx | .... |
| Reserve for Amortized Devaluation in Inventories | .... | .... | .... | $xxx |
| For amortized devaluation in Cost of Goods Sold account. | | | | |

| | For store building | | For factory building | |
|---|---|---|---|---|
| *Cost Debit Adjustment* | | | | |
| Earned Surplus | $xxx | .... | $xxx | .... |
| Cost Debit Adjustment Absorbed | .... | $xxx | .... | .... |
| Reserve for Amortized Cost Debit Adjustment in Inventories | .... | .... | .... | $xxx |
| For amortized cost debit adjustment for period. | | | | |
| Reserve for Amortized Cost Debit Adjustment in Inventories | .... | .... | $xxx | .... |
| Cost Debit Adjustment Absorbed | .... | .... | .... | $xxx |
| For amortized cost debit adjustment in Cost of Goods Sold account. | | | | |
| *Cost Credit Adjustment* | | | | |
| Cost Credit Adjustment Absorbed | $xxx | .... | .... | .... |
| Reserve for Amortized Cost Credit Adjustment in Inventories | .... | .... | $xxx | .... |
| Earned Surplus | .... | $xxx | .... | $xxx |
| For amortized cost credit adjustment for period. | | | | |
| Cost Credit Adjustment Absorbed | .... | .... | $xxx | .... |
| Reserve for Amortized Cost Credit Adjustment in Inventories | .... | .... | .... | $xxx |
| For amortized cost credit adjustment in Cost of Goods Sold account. | | | | |

It should be noted that the above entries are satisfactory to all accountants except those that prefer the quasi-reorganization procedure; the "absorbed" accounts may be closed to Profit and Loss by accountants who do not want appraisals to affect the net income balance or closed to Earned Surplus by accountants who hold that appraisals should affect the net income balance.

*Valuation-budgetary reserve balances.* The procedure recommended for the determination of the final balance of the Reserve for Interdepartmental Profit in Inventories (see page 161) and of the Reserve for Imputed Interest on Investment in Inventories (see page 164) may be adapted for use with the imputed costs involved in appraisals. This procedure may be divided into the following steps:

1. Compute the equivalent production for each cost element using the ordinary process cost method.

2. Set up the ordinary process costs inventory schedules for all costs not affected by the appraisal; there must be a separate schedule for each cost element having an individual equivalent production.

3. Set up special process costs inventory schedules for all costs affected by the appraisal; the cost elements affected by the appraisal are the Burden in Process account for each department using appraised fixed assets, the Prior Dept. Costs account for each department receiving transfers from any department using appraised fixed assets, and the Finished Goods ac-

count. These special schedules have columns for Units, Tax Basis Cost — Rate, and Tax Basis Cost — Total. The Tax Basis Cost columns record all costs not affected by the appraisal. The Tax Basis Cost figures plus the amortized cost debit adjustment, if any, or minus the amortized cost credit adjustment, if any, are recorded in the Adjusted Cost columns. The Adjusted Cost figures plus the amortized appreciation, if any, or minus the amortized devaluation, if any, are recorded in the Recorded Values columns.

4. Using the figures on the Initial Inventory lines, verify that the Adjusted Cost — Total figures minus the Tax Basis Cost — Total figures equal, if positive, the initial balance of the Reserve for Amortized Cost Debit Adjustment in Inventories account, or if negative, the initial balance of the Reserve for Amortized Cost Credit Adjustment in Inventories account; and that the Recorded Values — Total figures minus the Adjusted Cost — Total figures equal, if positive, the initial balance of the Reserve for Amortized Appreciation in Inventories account, or if negative, the initial balance of the Reserve for Amortized Devaluation in Inventories account.

5. Using the figures on the New Production lines of the Burden in Process schedule for the department actually using the appraised fixed asset, verify that the Adjusted Cost — Total figures minus the Tax Basis Cost — Total figures equal, if positive, the new credit to the Reserve for Amortized Cost Debit Adjustment in Inventories account, or if negative, the new debit to the Reserve for Amortized Cost Credit Adjustment in Inventories account; and that the Recorded Values — Total figures minus the Adjusted Cost — Total figures equal, if positive, the new credit to the Reserve for Amortized Appreciation in Inventories account, or if negative, the new debit to the Reserve for Amortized Devaluation in Inventories account.

6. Complete the ordinary and special inventory schedules for the department using the appraised fixed asset. Take up on the New Production line on the inventory schedule for the Prior Dept. Costs of the department receiving transfers from the department using the appraised fixed asset all transferred costs not affected by the appraisal, placing them in the Tax Basis Cost columns and adding (or subtracting) the transferred imputed costs in the other columns as usual.

7. Complete the ordinary and special inventory schedules for the department receiving transfers from the department using the appraised fixed asset. Take up on the New Production line on the inventory schedule for Finished Goods the transferred-in costs, recording the costs not affected by the appraisal in the Tax Basis Cost columns and adding (or subtracting) the transferred imputed costs in the other columns as usual.

8. Complete the special inventory schedule for Finished Goods. Using the figures on the Units Sold line, verify that the Adjusted Cost — Total

figures minus the Tax Basis Cost — Total figures equal, if positive, the new debit to the Reserve for Amortized Cost Debit Adjustment in Inventories account, or if negative, the new credit to the Reserve for Amortized Cost Credit Adjustment in Inventories account; and that the Recorded Values — Total figures minus the Adjusted Cost — Total figures equal, if positive, the new debit to the Reserve for Amortized Appreciation in Inventories account, or if negative, the new credit to the Reserve for Amortized Devaluation in Inventories account.

9. Using the figures on the Final Inventory lines, apply the procedure in (4) to verify the final balances of the valuation-budgetary reserves.

*Illustrative problem.* To emphasize the points involved and at the same time save space, the problem below omits the data concerning the prime costs of the departments involved and the burden costs for the second department; such costs have no effect on the valuation-budgetary reserves. In order that the accuracy of the data may be readily verified, the department using the appraised fixed asset had the same amount of burden and the same equivalent production each period and the department receiving the units from the department using the appraised fixed asset had no spoilage; these facts make the imputed costs per unit of production the same in both periods but do not vitiate the problem as an illustration of the procedures involved in accounting for valuation-budgetary reserves.

*Illustrative Problem No. 7*

On January 1, 1946, a company had the building occupied by Dept. A appraised. The building was purchased 10 years before for $150,000, original estimated life 50 years. The appraisal gave the reproduction-new cost as $180,000 and the remaining estimated life as 50 years. Each year Dept. A had burden costs, other than depreciation on its building, of $20,000. The following number of units of a single product were involved:

| *Dept. A* | 1947 | 1948 |
|---|---|---|
| Initial inventory in process (half done as to burden) | ..... | 1,000 |
| New units started | 10,500 | 10,300 |
| Final inventory in process (half done as to burden) | 1,000 | 1,600 |
| Transferred to Dept. B | 9,500 | 9,700 |
| *Dept. B* | | |
| Initial inventory in process (all done as to prior department costs) | ..... | 500 |
| New units started | 9,500 | 9,700 |
| Final inventory in process (all done as to prior department costs) | 500 | 800 |
| Transferred to stockroom | 9,000 | 9,400 |
| *Stockroom* | | |
| Initial inventory | ..... | 200 |
| New units received from Dept. B | 9,000 | 9,400 |
| Final inventory | 200 | 600 |
| Units sold | 8,800 | 9,000 |

Prepare the special inventory schedules and T-accounts for the inventories and the valuation-budgetary reserves involved.

| | Units | Tax Basis Costs Rate | Tax Basis Costs Total | Adjusted Cost Rate | Adjusted Cost Total | Recorded Values Rate | Recorded Values Total |
|---|---|---|---|---|---|---|---|
| *Finished Goods* (partial) | | | | | | | |
| 1948 | | | | | | | |
| Initial inventory | 200 | $2.24 | $ 448 | $2.25 | $ 450 | $2.30 | $ 460 |
| New units from Dept. B | 9,400 | 2.24 | 21,056 | 2.25 | 21,150 | 2.30 | 21,620 |
| Total | 9,600 | 2.24 | $21,504 | 2.25 | $21,600 | 2.30 | $22,080 |
| Final inventory | 600 | 2.24 | 1,344 | 2.25 | 1,350 | 2.30 | 1,380 |
| Units sold | 9,000 | 2.24 | $20,160 | 2.25 | $20,250 | 2.30 | $20,700 |

While the foregoing problem is simplified by the omission of data that do not affect the valuation-budgetary reserves and by having the annual costs and equivalent production constant, the solution shows that the rules for procedure given above were followed, that the final balances of the valuation-budgetary reserves were 5 cents (for appreciation) or 1 cent (for cost debit adjustment) per unit of equivalent production in the inventory in Dept. A and per unit of actual production in the inventory in Dept. B and the stockroom, that the credits to the reserves were amounts of amortized imputed costs charged to Burden in Process by the department using the appraised fixed asset, and that the debits to the reserves were the amounts of amortized imputed costs contained in the charge to the Cost of Goods Sold account.

**Incorporation of firms owning depreciable or depletable assets.** During recent years many corporations have been formed by persons who previously operated individual proprietorships or partnerships. In the event this happens, a tax accounting problem will arise if the corporation records the depreciable or depletable property at any figure other than the one which has previously been used in filing the tax returns of the predecessor business unit. From the standpoint of the corporation, however, it may not be desirable or acceptable to issue for the property the same par (or stated) value of capital stock as existed prior to the exchange; yet the Internal Revenue Code [Section 113 (a)(6)] provides that there shall be no change in the dollar base for depreciation or depletion if the incorporators transfer the assets to the corporation under what is styled a "tax-free exchange." A tax-free transfer takes place if the following conditions are met:

1. The property must be transferred to the corporation solely in exchange for its stock or other securities.

2. The persons who exchange the property for stock or securities must be in control of the corporation immediately after the transfer. "Control" has reference to the ownership of at least 80 per cent of the total voting rights and at least 80 per cent of all the remaining classes of stock outstanding in the corporation.

## T-Accounts

Dept. A
Burden in Process

| | | | |
|---|---|---|---|
| 1/1/47 Balance | ..... | 1947 To Dept. B | $21,850 |
| 1947 Costs | $23,000 | 12/31/47 Balance | 1,150 |
| | $23,000 | | $23,000 |
| 1/1/48 Balance | $ 1,150 | 1948 To Dept. B | $22,310 |
| 1948 Costs | 23,000 | 12/31/48 Balance | 1,840 |
| | $24,150 | | $24,150 |

Reserve for Amortized
Appreciation in Inventories

| | | | |
|---|---|---|---|
| 1947 To P. & L. | $ 440 | 1/1/47 Balance | ..... |
| 12/31/47 Balance | 60 | 1947 Credit | $ 500 |
| | $ 500 | | $ 500 |
| 1948 To P. & L. | $ 450 | 1/1/48 Balance | $ 60 |
| 12/31/48 Balance | 110 | 1948 Credit | 500 |
| | $ 560 | | $ 560 |

Finished Goods

| | | | |
|---|---|---|---|
| 1/1/47 Balance | ..... | 1947 To P. & L. | $20,240 |
| 1947 From Dept. B | $20,700 | 12/31/47 Balance | 460 |
| | $20,700 | | $20,700 |
| 1/1/48 Balance | $ 460 | 1948 To P. & L. | $20,700 |
| 1948 From Dept. B | 21,620 | 12/31/48 Balance | 1,380 |
| | $22,080 | | $22,080 |

Dept. B Prior Dept.
Costs in Process (Partial)

| | | | |
|---|---|---|---|
| 1/1/47 Balance | ... | 1947 To Stockroom | $20,700 |
| 1947 From Dept. A | $21,850 | 12/31/47 Balance | 1,150 |
| | $21,850 | | $21,850 |
| 1/1/48 Balance | $ 1,150 | 1948 To Stockroom | $21,620 |
| 1948 From Dept. A | 22,310 | 12/31/48 Balance | 1,840 |
| | $23,460 | | $23,460 |

Reserve for Amortized Cost Debit
Adjustment in Inventories

| | | | |
|---|---|---|---|
| 1947 To P. & L. | $ 88 | 1/1/48 Balance | ..... |
| 12/31/47 Balance | 12 | 1947 Credit | $ 100 |
| | $ 100 | | $ 100 |
| 1948 To P. & L. | $ 90 | 1/1/48 Balance | $ 12 |
| 12/31/48 Balance | 22 | 1948 Credit | 100 |
| | $ 112 | | $ 112 |

Profit and Loss
(including Cost of Goods Sold, Appreciation
Absorbed, and Cost Debit Adjustment Absorbed)

| | | | |
|---|---|---|---|
| 1947 Cost of Sales | $20,240 | 1947 Appreciation Absorbed | $ 440 |
| | | 1947 Cost Debit Adjustment Absorbed | 88 |
| | | 1947 Closing | 19,712 |
| | $20,240 | | $20,240 |
| 1948 Cost of Sales | $20,700 | 1948 Appreciation Absorbed | $ 450 |
| | | 1948 Cost Debit Adjustment Absorbed | 90 |
| | | 1948 Closing | 20,160 |
| | $20,700 | | $20,700 |

3. When two or more persons make the transfer of the property, the control must still be present, and in addition the issuance to the separate persons of the stock and securities must be in substantial proportion to the fair value of the property prior to the transfer. In brief, this means that the par (or stated) value of the stock issued to each of the incorporators should be related to the current value of the depreciable property rather than to its book value in the hands of the individual proprietorship or partnership.

No difficult accounting problem will arise, of course, if the book value of the property is identical with its current market price at the date of the transfer to the controlled corporation.

When the market price differs substantially from the book value of the assets in the hands of the predecessor partnership or other owner, it may be desirable to use the "hyphenated account" plan previously described in this chapter. The following illustrative problem presents a technique which may be employed:

*Illustrative Problem*

The Impli Corporation is organized on January 1 to carry on the business previously conducted by the partnership of R, S, and T. The trial balance of the partnership on the same date is as follows (profits and losses shared equally):

| | | | |
|---|---|---|---|
| Cash | $ 400 | Payables | $ 500 |
| Receivables | 600 | Reserve for Depreciation — Building | 1,200 |
| Inventory | 900 | Reserve for Depreciation — Fixtures | 400 |
| Land | 2,000 | R, Capital | 1,000 |
| Building | 4,000 | S, Capital | 2,000 |
| Fixtures | 1,000 | T, Capital | 3,800 |
| | $8,900 | | $8,900 |

The fair value of the property at January 1 is:

| | |
|---|---|
| Land | $2,500 |
| Building | 3,600 (estimated future life 8 years) |
| Fixtures | 500 (estimated future life 4 years) |
| All other assets | (same as on trial balance) |

Capital stock is issued as follows: R, $1,400; S, $2,400; T, $4,200.

Prepare entries to show (1) the formation of the corporation and (2) to record the depreciation for the first year, assuming that the books are to reflect the income tax treatment and also the general accounting technique.

*Solution*

| | | |
|---|---|---|
| (1) Entry to issue the stock to the partners: | | |
| Cash | $ 400 | |
| Receivables | 600 | |
| Inventory | 900 | |
| Land — Transferors' Basis | 2,000 | |
| Land — Appraisal Increase | 500 | |
| Building — Transferors' Basis (Gross) | 4,000 | |
| Building — Cost Debit Adjustment | 800 | |
| Fixtures — Transferors' Basis (Gross) | 1,000 | |
| Payables | | $ 500 |
| Fixtures — Cost Credit Adjustment | | 100 |
| Reserve for Depreciation — Building — Transferors' Basis | | 1,200 |
| Reserve for Depreciation — Fixtures — Transferors' Basis | | 400 |
| Capital Stock | | 8,000 |
| (2) Entry for depreciation for first year: | | |
| Depreciation — Building — Amortized Transferors' Basis (taxable deduction) | $ 350[a] | |
| Depreciation — Building — Amortized Cost Debit Adjustment (nontaxable deduction) | 100[b] | |
| Depreciation — Fixtures — Amortized Transferors' Basis (taxable deduction) | 150[c] | |
| Fixtures — Cost Credit Adjustment | 25[d] | |
| Reserve for Depreciation — Building Transferors' Basis | | $ 350 |
| Building — Cost Debit Adjustment | | 100 |
| Reserve for Depreciation — Fixtures — Transferors' Basis | | 150 |
| Depreciation — Amortized Cost Credit Adjustment (nontaxable item) | | 25 |

*a.* ($4,000 − $1,200) ÷ 8 years = $350.
*b.* $800 ÷ 8 years = $100.
*c.* ($1,000 − $400) ÷ 4 years = $150.
*d.* $100 ÷ 4 years = $25.

**Donation of fixed assets.** Business firms occasionally receive fixed assets as gifts from one or more of the owners, from a governmental unit, or from a group of other persons who hope thereby to gain some reciprocal advantage in later years.

It is appropriate to treat this matter in a discussion of fixed asset appraisals since many accounting authorities recommend that such assets be recorded at their fair appraised value, if title to the property is complete and clear.[93]

As indicated in Chapter 4, the present writers recommend that any credits resulting from donations of fixed assets be recorded in the Paid-in Surplus account (if the asset is received from one or more of the owners of the enterprise), or in the Donated Surplus account (if the asset is received from any other class of donor). This differentiation will enable the accountant to distinguish between contributed and accumulated capital.

[93] (1940) Paton-Littleton 28; (1946) Finney, I, 304; (1939) Gilman 479; Executive Committee, American Accounting Association, 23 *Accounting Review* 340.

The accountant who supports the "cost principle" for recording fixed assets usually does not favor the appraisal method of handling the donation of an asset. He insists that since there is no immediate outlay for the asset, no amount (other than perhaps a nominal dollar or two) should be entered in the accounts.[94] It is entirely permissible, however, and even recommended by some writers, to show the appraisal values on the balance sheet as explanatory or parenthetical notes.

The merits of the proposition (as to whether the donated asset should be recorded at an appraised value) are similar to those pertaining to appraisals in general; these have been treated at length in prior sections of this chapter. However, the accountants who ordinarily support the "cost principle" often note that the nominal-value-record technique is (1) "unfair" to the business, (2) gives a "gross undervaluation" to the fixed assets, and (3) does not allow for the "proper accounting for the resources" of the business unit. When these phrases are used it is difficult to determine what implications underlie them; the same phrases may be used to describe the supposed defects of the entire cost emphasis methodology.

*Post-acquisition expenditures.* It is commonly taken for granted that any expenditure incurred in acquiring or placing in use the donated asset will be charged to the Donated Surplus (if this account is set up), or to the Fixed Asset account (if the asset is recorded at a nominal sum when donated). More accurately, it would be preferable, if an appraisal is made, to record the appraised value at a figure which would reflect the anticipated expenditures to be incurred in getting the asset into full use; that is, lower the appraisal figures for this purpose. Any subsequent outlays under this treatment would be debited to the Asset account.

*Donations with conditional titles.* Some firms receive assets from various sources on a contingent gift basis; that is, the firm must employ so many people for a certain length of time or meet certain other prerequisites. The customary treatment in this situation is to omit the formal appraisal (if the appraisal method is being used) until such time as the conditions have been fulfilled. The asset may, however, be shown as a contingent asset on the balance sheet offset with a Reserve for Donated Property. The dollar amount used in this last entry should reflect (by its lower amount) any anticipated expenditures to be incurred by the firm in obtaining full and complete title at a later date.

*Donated fixed assets and subsequent depreciation.* Some donated assets may be of the depreciable variety. In connection with the accounting for this type, the question arises as to whether depreciation should be recorded. Practically the same accounting considerations are involved in this decision as in regard to the appraisal increment discussed previously in this chap-

[94] Borth, 23 *Accounting Review* 177.

ter. As before noted, accountants do not hold a unanimous opinion on this matter, although the tendency is to support the view that if an asset is set up at its donated appraised value, this value should be depreciated over the useful life of the property by charges against the revenue of the firm. This would, of course, reduce the reported operating income of the firm. The credit would be to Reserve for Depreciation. Further, the Donated Surplus account may be amortized each time a depreciation entry is recorded. This periodic amortization (for the same dollar amount as the depreciation entry) is credited to Earned Surplus, or to Donated Surplus Absorbed account which in turn is closed to Profit and Loss. It has also been recommended that the transfer from Donated Surplus to Earned Surplus be contingent upon the formal action of the board of directors.[95]

An alternative treatment is to let the depreciation be a balance sheet matter only by debiting Donated Surplus and crediting the Reserve for Depreciation.

The opinion of the present authors in regard to the matter of depreciation on appraisals was given on a preceding page of this chapter and thus need not be repeated here.

*Gifts of cash followed by fixed asset purchase.* Occasionally a business firm will receive a cash donation which is to be used to purchase some one or more fixed assets. In this event the question arises as to whether the donation is to be associated with the cash or with the fixed asset acquired. The answer to this question is important because of the possible implication as to depreciation on the asset, assuming that it is depreciable. If the cash is considered the source of the donated surplus, there would be no question about the reasonableness of charging depreciation on the asset purchased, since it would have a "cost" as basic as that of any other asset. If on the other hand, the cash donation and the fixed asset purchased are viewed as dependent one upon the other, the depreciation problem would be similar to that discussed on previous pages of this section. Some accountants, incidentally, who insist upon the independence of the transactions in support of their view that depreciation must be charged against the revenue of the firm, use the same line of reasoning to lend emphasis to their belief that depreciation should also be considered an expense of the firm in the event of a direct gift of the plant building or piece of equipment. In other words, there should be no difference in the final implications of the two situations.[96]

[95] (1938) Taylor-Miller 173.
[96] (1942) Fjeld-Sherritt 248.

# CHAPTER 12

## Nature of Business Income and Its Realization

**Business income and economic income.** The term "income," like many others used in accounting, has several meanings and implications. Fundamentally, practically all of the economic conceptions stem from the thought that income is related to a flow of services or benefits through the passing of time.[1] This stream of services may be viewed from three sides: (1) psychic income, (2) money income, and (3) real (or purchasing power) income. Accountants, at least in their professional work, do not often use the term psychic income, since the latter refers to the satisfactions or enjoyments associated with income. Money income (or income measured in terms of money), on the other hand, constitutes the principal forte of the accounting process. The concept of real income enters into accounting thinking in connection with the desirability of maintaining the invested capital in terms of purchasing power; it is also the basic consideration of "stabilized" accounting (see Chapter 16).

From what has been stated above it may be observed that the economic conception of income is concerned with individual as well as business-unit income. Accounting, on the other hand, is usually associated only with the income of the business unit (or "firm" as it is often called). Business income is thus synonymous with enterprise income; its measurement in recent years has become the primary goal of the accounting process.

Business income is to be distinguished from business revenues. The latter term is employed to cover the monetary value of the flow of services rendered to customers, or products delivered, in return for which valid claims for recompense are received. Business income, in contrast, raises the question as to how much is "left over"; it connotes some aspect of a "net figure." Due to the nature of the proposition, however, it is impossible to divorce the problems associated with the determination of business revenue from those concerned with business income; the one presupposes the other. Much of the discussion, therefore, of business income is also directly related to business revenues.

*Business income from the managerial versus the proprietary approach.* As discussed briefly in the first chapter of this text, there are two viewpoints which may be taken as to the nature of business income. Under the entity or managerial approach, income is thought of as representing the net monetary reward derived from all sources by the skillful conduct of the enterprise. Under this view, it makes no difference who furnishes the

[1] Bangs, 15 *Accounting Review* 355.

resources; they may be stockholders, bondholders, or other parties. Under the proprietary view, on the other hand, business income consists only of that net portion accruing to the residual group ordinarily referred to as the owners.

Both of these approaches to business income have several useful characteristics. Traditionally, accountants have felt that the proprietary concept is of most significance in the final analysis, and they have, therefore, emphasized it in their income statement presentations. Especially has this been true in regard to the unincorporated firm. In the latter type of organization, it seems more "realistic," to the proprietors at least, to view income only in a net "sense," that is, after all charges including interest and rents. In a large enterprise, on the other hand, in which the revenue producing means have been gathered from many sources, the management is more likely to take the position that business income comprehends the net reward obtained by all the beneficial interests therein. Under an adequate income statement classification scheme, it is possible to indicate to the reader what the business income is under both approaches. However, this is rarely done in practice, except on statements of railroads or other public utilities.

**Modern emphasis on income reporting.** During the past decade a great deal of emphasis has been placed on the reporting of income as it relates to the accounting process.[2] At first glance it appears strange that one of the two principal accounting statements should receive more emphasis than the other. But such has been the case. In point of time the balance sheet was the first to gain the ascendency, and, for reasons to be explained below, it maintained its dominancy for many years.

Several reasons may be advanced as to why the balance sheet was able to maintain its position so long: (1) The creditor emphasis in accounting, (2) the attitude of the courts, and (3) the attitude of investors.

The creditor emphasis in accounting has long been a prominent factor in determining how certain matters will be handled in the accounts and on the statements. It gives rise, for example, to the doctrine of conservatism and to the problems associated with determining the financial condition of the business unit. The furnishing of information to the creditors has always been a significant feature of the duties of the accountant, but, as the decades have passed by, the creditor emphasis has become less controlling in accounting decisions. Business units in general have become less dependent upon credit as a means of financing operations. This has naturally lessened the relative importance of the balance sheet, since the latter statement is the primary representation of the immediate debt-paying

[2] See particularly (1939) Gilman (entire book); Mackenzie, 24 *Accounting Review* 360–368; Bailey, 26 *Harvard Business Review* 680.

ability of the enterprise. Credit analysts have also begun to view the problem of determining a satisfactory credit risk as a twofold one; that is, the income position should be considered along with the financial items listed on the balance sheets, particularly in connection with long-term obligations. The creditor emphasis in part, however, caused balance sheet matters to dominate accounting thinking until relatively recent years.

The courts have also contributed to the emphasis on the balance sheet. As is well known, the law is concerned with equities, property rights, and values. These are mostly balance sheet concepts and problems, and since the law has a direct influence on accounting in that the accountant must not violate the law, it is natural that accounting thinking will always be colored by legal considerations. While unsatisfactory laws may be repealed or amended through the influence of accountants, until the laws are modified they will continue to lend their weight to the handling of accounting problems involving conflicts of emphasis between the balance sheet and the income statement. The courts, therefore, undoubtedly gave impetus to the balance sheet dominancy in the formative years of modern accountancy.

The depression of the early 1930's and the federal security legislation of 1933 and 1934 have awakened interest in the investor's viewpoint; they also were a force of some magnitude lending weight to the shift of emphasis from the balance sheet to the income statement. While most investors pay some attention to the balance sheet, they are more often attracted by the earnings of the business unit. This point has been made by many authorities. For example: "It is fairly well recognized by intelligent investors today that earning power is the fact of crucial importance in the valuation of an individual enterprise, and that, therefore, the income account is usually far more important than the balance sheet." [3] In the earlier years of American business, the owners and managers were usually the same group and could, therefore, "keep their fingers on the pulse" because of their close association with the activities of their firm. There was not as much need for emphasis on the reporting of the periodic results or the progress of the enterprise. Such matters were under the constant observation of the owners. In more modern times, however, especially in large corporations, the management is often a separate group of elected officials. In these cases, it is necessary for the investors to rely upon accounting reports for information concerning the periodic progress of the business units in which they are interested. This naturally lends greater emphasis to income reporting as contrasted with the facts presented on balance sheets.

[3] *Corporate Accounts and Reports* (New York: American Institute of Accountants, 1932), p. 8.

**Accounting problems arising from the transition of emphasis.** The transition of emphasis in accounting referred to in the previous section has given rise to many important implications. As is well known, responsibility is the constant companion of leadership. Now that the income statement has assumed a position of dominancy in the eyes of those who make use of accounting statements, it has certain obligations which it must discharge if that position is to be maintained. The balance sheet became the statement of second rank primarily because of its inadequacy in serving the users of statements. The exact place of the income statement, however, has not as yet been determined; the theory concerning it is still in a state of flux.

Formerly, the view was widely held that the profit and loss statement was simply a connecting link between successive balance sheets. Today, the reverse position is more generally accepted — balance sheets serve as the tie-in between successive income statements. This means that wherever any conflicts of attention arise, the income viewpoint is to govern the decision.

One of the implications of the transition of emphasis is associated with difficulties which lie in the path of formulating accounting principles or standards. Much attention has been devoted to this phase of the development in recent years. As one authority has pointed out, several of the difficulties of formulation are contributed by the shift in emphasis.[4] Standards that appear acceptable from the balance sheet viewpoint must be re-examined. Accountants have not decided whether the standards are modified merely because of the transition of emphasis, but by all counts the transition has accentuated the need for standards.

A second implication is concerned with the increased scrutiny with which inventory accounting must be viewed due to this shift in emphasis.[5] The balance sheet view as to inventories and their classification is largely based on realizability in case of liquidation. This naturally is a creditor emphasis. Liquidation values mean little from the income view where the primary concern is with the allocation of costs to accounting periods; inventories here are regarded as deferred charges to future revenue to be allocated to the periods in which the revenue is recorded. It follows from this that costs represent the controlling figure for income statement purposes. The thinking is based on the theory that there is no more reason to vary the valuation of a deferred charge to future revenue than there is to undervalue or overvalue a current charge to current revenue. This in the final analysis means a departure from the traditional cost or market, whichever is lower, method of pricing inventory, in so far as its effect on the income statement is concerned.

[4] (1939) Gilman 174.
[5] See, for example, Husband, 21 *Accounting Review* 115.

A third implication of the transition of emphasis is related to the social and economic values inherent in the accounting process. As two authorities have expressed it: "Capital should flow into those industries which serve the public interest, and within an industry into those enterprises in which the management is capable of using capital effectively. If capital in an enterprise is earning a return over a considerable period, this probably indicates that the capital is being capably employed in an industry serving an existing demand; if the capital is not earning a return over a period of time, this probably indicates that capital is lodged in incapable hands or in an industry whose service is not in continuing demand. The social importance of accounting, therefore, is clear, especially in relation to the income statement, since dependable information about earning power can be an important aid to the flow of capital into capable hands and away from unneeded industries." [6] This puts even more emphasis on the income statement than is at first apparent, and adds immeasurably to the responsibility of the accountant.

A fourth repercussion is concerned with what may be called "complete income reporting." Over the years there have developed two different viewpoints as to the nature of the representations presented on the income sheet. One view, which is now referred to as the "earning power concept," takes the position that the income statement should contain only those items which will aid the reader in determining the intermediate and long-term possibilities for profit. This theory, in the final analysis, means that only usual and recurring revenues and expenses would be admitted to the statement of income, all other charges and credits being handled through the statements of surplus, or by some other means. The second view, which may be titled the "historical or all-inclusive concept," assumes that a series of income statements should contain all items affecting asset augmentation or diminution with the exception of adjustments of proprietary interests. The end result desired here is that over a period of time the income statements will present all factors affecting the progress or lack of progress of the business unit; it is essentially a recapitulation, therefore, of past events — an historical looking document — rather than one looking toward the future. Both of these concepts have been widely discussed by accountants in recent years. Since this matter is treated more at length in the next chapter, it is sufficient at this point to indicate that such a difference of approach to the income statement had no great practical significance so long as the balance sheet was emphasized in accounting. It is only with the change of attention that the issue at stake assumes much importance.

**Income statement terminology.** In recent years, the question of the

[6] (1940) Paton-Littleton 3.

appropriateness of the expressions used on the income statement has received much more attention than in the earlier days of accounting. Even the title of the statement itself has been the subject of some investigation. As is well known, up to the past decade or so, the term "Profit and Loss Statement" was the most frequent style of caption for the ordinary mercantile or manufacturing concern. The use of the words "profit" and "loss," however, has been constructively criticized in that they connote more finality than the accountant has in mind in presenting the fiscal reports of business units. The well-informed accountant recognizes that the figures presented are to a varying extent tentative in nature, but the impression passed on to the layman through the use of the expression "profit and loss" may be different. Somewhat the same objection could be leveled at the phrase "income statement." Both of the captions, "Progress Report" and "Interim Income Sheet," have been suggested as desirable alternative titles in order to negative the implication of "true profit." Accountants have not in general accepted these expressions, however, preferring to call to the attention of the reader the tentative character of the income statement figures by comments attached thereto, as well as public educational campaigns.[7]

**Single step statements versus the multiple step.** In addition to the problem of selecting an adequate caption for the income sheet, a difference of opinion exists concerning the ranking of items within the statement. This difference may be indicated succinctly by an examination of the two following exhibits:

EXHIBIT I (Single Step)

**THE PROGRESSIVE COMPANY**

**Income Sheet**

For Year 195–

| | | |
|---|---|---|
| Revenue from sales or services | | $455 |
| (After deducting discounts, returns, and allowances of $45) | | |
| Other revenues: | | |
| Profit on sale of investments | $ 10 | |
| Interest income | 15 | |
| Dividends | 10 | |
| Refunds of prior years' taxes | 15 | 50 |
| Total revenues | | $505 |

[7] For example, in "Financial Statements — What They Mean" (American Institute of Accountants) the point is made that "financial statements do not profess to show with mathematical exactitude either financial position or profit and loss of an enterprise, but are based largely upon judgment and opinion" (p. 14). Again, in Editorial, 81 *Journal of Accountancy* 355, "Profit, or net income, as shown in corporate financial statements, is a calculation (based in part on estimates and probabilities) of what is left for the owners as a result of a year's activities . . ."

| | | |
|---|---|---|
| Total revenues (details on page 397) | | $505 |
| Expired costs, expenses, and losses: | | |
| Cost of sales (including depreciation of $70) | $250 | |
| Selling expenses (including depreciation of $10) | 30 | |
| Administrative expenses (including depreciation of $5) | 40 | |
| Fire loss | 10 | |
| Loss on abandoned property | 30 | |
| Bond discount amortized and bond interest | 10 | |
| Income tax for a prior period | 10 | |
| Federal and state income tax for current year | 35 | 415 |
| Income to all stockholders | | $ 90 |

EXHIBIT II (Multiple Step)

**THE PROGRESSIVE COMPANY**

**Income Sheet**

For Year 195–

| | | |
|---|---|---|
| Gross revenue from sales or services | | $500 |
| Less: Discounts, returns, and allowances | | 45 |
| Net revenue | | $455 |
| Cost of sales (including depreciation of $70) | | 250 |
| Gross margin (or profit) | | $205 |
| Selling expenses (including depreciation of $10) | | 30 |
| Selling profit | | $175 |
| Administrative expenses (including depreciation of $5) | | 40 |
| Operating profit | | $135 |
| Other income: | | |
| Profit on sale of investments | $10 | |
| Interest income | 15 | |
| Dividends | 10 | |
| Refunds of prior years' taxes | 15 | 50 |
| Total income | | $185 |
| Income deductions: | | |
| Fire loss | $10 | |
| Loss on abandoned property | 30 | |
| Bond discount amortized and bond interest | 10 | |
| Income tax for a prior period | 10 | 60 |
| Balance of net income before taxes on current income | | $125 |
| Provision for federal and state tax on income | | 35 |
| Income to all stockholders | | $ 90 |

The single step form of presenting the income statement has been adopted by prominent business firms in recent years. It has several features in its favor which, according to its advocates, make it superior to the multiple step form: (1) The striking of intermediate differences such as gross profit, selling profit, total income, and others (see Exhibit II above) is conducive to reader misconception in view of the wide variation in opinion as to what these terms represent. (2) The single step form reflects a more "realistic" conception of the nature of business profit, i.e., that there is no profit of

*any* kind until *all* the expired costs, expenses, and losses have been offset against revenues. (3) In the single step form there is no "ranking" of items. The authorities supporting this form insist that the multiple step presentation connotes to the reader that certain expired costs and expenses are more significant than others in determining the net income and that such items as cost of sales are "recovered first" from the customers or clients.[8] Moreover, under the multiple step form it is implied that there is some type of an income before taxes on income have been deducted; this is extremely illogical according to the single step proponents.

The persons who view the multiple step form as being more useful point out that it is fundamental to the accounting process to classify items and to distinguish between them. They insist that it is an accounting responsibility to indicate to the reader the differentiations possible on the income statement, since the accountant is usually in a far better position than most people to recognize such things. Then, too, they bring out the fact that some items on the income statement are more significant than others — in dollar amounts if for no other reason — and these items should be emphasized on the report. Again, it has been suggested that accountants cannot erect in the minds of business people and the public a type of income statement and then proceed later to destroy the structure with ease; or if it be destroyed, the equal task remains of building a substitute. Many managers, for example, are interested in gross profit (or margin) for various reasons, and it does no harm to emphasize this figure even though there are no uniform standards employed in its determination.

From what has been stated above, it is apparent that the controversy centers around which of the two forms is more helpful in obtaining an understanding of the progress of the individual business unit. No concensus is available at the present time favoring either form although the multiple step presentation has been the one more widely recommended in prior years. One study made in 1949 by the American Institute of Accountants [9] yielded the following results:

| Number of firms | |
|---|---|
| 363 | Multiple step form |
| 78 | Single step form |
| 44 | Single step form with exception of income tax provision or credit deducted or added separately |
| 14 | Single step form with exception of income tax provision and other item(s) deducted or added separately (McCall Corp.) |
| 7 | Single step form with exception of items other than income tax provision (exclusive of appropriations)(International Paper Co.) |
| 12 | Abbreviated — beginning after "gross profit" item — not classified |

[8] Paton, 75 *Journal of Accountancy* 10.

[9] *Accounting Trends in Corporate Reports, 1949*, p. 56 (quoted by permission).

**Premises for income determination.** There are no mathematical formulas for determining net income, as the conditions under which it arises are too varied to make the use of formulas practicable. Instead of formulas, accountants insist upon the consistent application of certain concepts which give rise to working rules tending to limit the area within which net income may be reasonably determined. These concepts are (1) the relation of income to proprietorship, (2) the dependence of asset valuation upon income determination and *vice versa*, (3) the realization of income, (4) the periodicity of income, (5) the distinction between income and saving, and the like.

*Proprietary equity increase not necessarily income.* While income always results in an increase in proprietorship, not all increases in the proprietary equity are income. The statement of income under the single-entry method of bookkeeping is founded upon this concept. Under the single-entry method, net income equals end-of-the-period proprietary equity, minus beginning-of-period proprietary equity, plus proprietor's drawings, minus proprietor's additional investments. Obviously, this procedure can only be used in simple cases because it ignores donations and unrealized appreciation. Accountants in general do not believe that donations give rise to realized revenue,[10] even if the item in question is a current asset.[11] As to unrealized appreciation, it was explained in Chapter 4 that this type of increase in proprietary equity is almost always barred as a source of realized revenue until the asset which has increased in market value has been sold or converted.

*Relation of the asset valuation problem to income.* The asset valuation problem is intimately related to the determination of periodic income. As discussed in the first part of this chapter, however, the emphasis in accounting in recent years has been changing to the view that, in cases of conflicts between the theories underlying the income statement and the balance sheet, the income statement is to predominate. This change of emphasis does not detract from the underlying premises of the theory of asset valuations for income determination; it simply transfers the accountant's attention. The premises are:

1. Valuations should be expressed in a monetary unit which is assumed to be a stable unit of purchasing power. An elaborate system for accounting for valuations, which allows for fluctuations in the purchasing power of money, has been developed; this system would be helpful in periods of extreme monetary inflation, but thus far it has been considered impracticable for ordinary use.[12] (See Chapter 16.)

[10] (1939) Gilman 111.

[11] *In Re General Income Shares*, Securities and Exchange Commission, Release 335, April, 1935.

[12] (1936) Sweeney (whole book).

2. Valuations should be based upon the going-concern concept, which views the business unit as having indefinite life. The going concern is the normal concern, rather than a financially embarrassed or insolvent business. Future use or consumption of the assets becomes the important premise, instead of the possible liquidation view.

3. All asset valuations start with the cost concept; this cost is the amount incurred or to be incurred by the owner, or the prospective cost to a creditor. For instance, the initial value of a fixed asset is the cost to its owner, while the initial value of an interest-bearing note receivable is the prospective cost to the creditor for the principal and interest.

4. The importance attached to the periodicity of income forces (a) the cost of assets consumed or used to be allocated over the accounting periods benefited thereby, and (b) the valuation of accruing assets to be increased proportionally with the passage of time.

5. The valuation of dissimilar assets acquired with a common purchase price involves the application of the relative sales value theory of allocating costs. This theory is often used wherever lump or "basket" purchases of inventory items and investments are made.[13]

These premises are discussed in some detail in later chapters of this text.[14]

*Realization of income.* Traditionally, accountants have departed only with some reluctance from the established standard that income is realized at the time of sale. This is true even though the sale basis is founded largely on legal considerations. The closing of each sale commits the customer to an agreement which admits of comparatively few adjustment possibilities; other tests of realization do not offer the same opportunity to "clinch" the income. As has been observed by several authorities, the sale basis to some extent removes the element of opinion from the question of determining realized income and makes the problem more objective.[15] This does not mean, however, that no problems remain; it simply removes from the realm of subjectivity a considerable amount of possible variation in income measurement.

While the sale basis is most widely used today, the "most theoretical concept of the income account is that . . . credits accrue to it from day to day . . ." [16] This has reference to the fact that in a modern business the income is realized in a constant stream throughout all the business operations, and does not actually emerge at any definite moment as is implied when the sale basis is used. Expediency dictates, however, the abandon-

[13] Newlove, 4 *Accounting Review* 251–254.

[14] See also Mackenzie, 24 *Accounting Review* 360–368; Davidson, 25 *Accounting Review* 45–57; Paton, 89 *Journal of Accountancy* 16–27.

[15] (1935) Porter-Fiske 338; (1943) Paton 111; Heilman, 4 *Accounting Review* 87.

[16] May, 63 *Journal of Accountancy* 348.

ment of the theoretical concept since in many instances the problem of measurement of income on any basis other than sales would be insurmountable.

The sales basis has been objected to by some accountants on the grounds of:

1. Likelihood of the firm suffering some bad debt losses if sales are made on credit
2. Possible nonliquidity of receivables in emergencies when obligations are due
3. Possibility of having expenses and expired costs related to the sale, after the sale has taken place, perhaps in a subsequent period

All three of these objections are pertinent but not controlling. In regard to the first, most firms set up an allowance for doubtful accounts which supposedly reduces the sales figure to a realizable amount. The second objection is of no great significance if the usual going-concern assumption is adopted, since the firm will, in the ordinary course of business, collect the receivables. It is true that as an emergency proposition the receivables may only be hypothecated for perhaps 50 per cent to 80 per cent of their book value, but under no basis of measurement of income (except the strictly cash basis) will the funds available for disposal equal the net income for each fiscal period. As to the last objection, expenses may be accrued within broad estimated limits in order to match more closely the sales revenue of any selected period against the expired costs and expenses of obtaining that revenue.

The sales standard cannot be strictly applied to shipments on approval, since title does not pass until approval by the customer, and also in the case of conditional sales contracts. Again, in business parlance the receiving of an order from a customer is sometimes called a "sale," even though in many cases the manufacture of the merchandise has not started. Obviously, such orders are not to be construed as realized revenue.

A second possible basis of income realization is the recognition of revenue in accordance with the amount of cash collected from the customers. This is often thought of as the most conservative basis, since the entrepreneur has little uncertainty relative to the receipt of income when cash is at hand. The objections to the cash basis, however, are quite weighty. For example, the problem of matching the cash measured revenue with the appropriate expired costs and expenses would be extremely difficult except in the simplest of instances. As one authority states: "If incomes are received in a period earlier than corresponding expenses are paid, the effect of handling them on a cash basis will be to increase the net income of the earlier period and to decrease that of the later period. One period might show a net gain and the other a net loss when as a matter of fact

the operations of the two periods were the same except for the dates of cash receipts and payments. The inadequacy and impropriety of such a method is particularly evident in corporate business where directors as well as stockholders are so largely dependent upon accounting records for their judgment of the profitableness or unprofitableness of periodic operations.[17]

The income tax laws provide that realized income shall be computed upon the basis of the taxpayer's accounting period (either a fiscal year or calendar year), in accordance with the method of accounting regularly employed by the taxpayer, but if no method of accounting is in use, the commissioner may prescribe the method which, in his opinion, will accurately portray profit.[18] The initial portion of this provision refers primarily to the beginning and termination dates of income determination, whereas the latter is concerned with the procedures and methods of accounting employed by the taxpayer or business in computing income. The methods of profit reporting for income taxes conform in many respects with recognized standards of accounting. What the taxing authorities wish to obtain — and this is the objective of the accountant — is the "true income" of the taxpayer; but the use of the word "true," as in the terminology of the accountant, refers to the most accurate profit obtainable under the circumstances.

Ascertainment of income, though, for tax purposes is bound by these broad rules:

1. In all cases in which the production or sale of merchandise is an income-producing factor, inventories of the merchandise on hand (including finished goods, work in process, raw materials and supplies) should be taken at the beginning and end of the year and used in computing the net income of the year.
2. Expenditures made during the year should be properly classified between capital and expense; that is to say, expenditures for items of plant equipment, etc., which have a useful life extending substantially beyond the year, should be charged to a capital account and not to an expense account.
3. In any case in which the cost of capital assets is being recovered through deductions for wear and tear, depletion or obsolescence, any expenditure (other than ordinary repairs) made to restore the property or prolong its useful life should be added to the property account or charged to the appropriate reserve and not current expenses.[19]

The above rules, of course, do not alter the accountant's procedure for determining revenue, expired costs, and losses. The problem of measuring income for tax purposes is as perplexing to the tax authorities as to the accountant, and there are many differences of opinion in regard to income determination for taxation and for ordinary business purposes.

[17] Scott, DR, *Theory of Accounts* (New York: Henry Holt and Co., 1925), pp. 49–51.
[18] Regulations 111, Section 29.41–1.
[19] Commerce Clearing House, Inc., *Federal Tax Service* (1944), Volume 1, Reg. 111, Paragraphs 393, 394, and 395.

*Realization of income — the time factor.* After discussing above the general problem of income realization, attention is now turned to the specific tests for realization. One authority has suggested that the principal tests should be: (1) the future receipt of money within one year is highly probable; (2) the amount to be received can be estimated with a high degree of reliability; and (3) the expired expenses associated with the income in the same cycle can be estimated.[20] The time factor of one year given by this authority has been referred to as a "practical rule" [21] rather than an "essential element" in determining an adequate test for income realization. The preferred view is that it is the "cash possibility" of any transaction which gives rise to realized income; the time element is important to be sure, but its significance lies in the direction of determining the future cash requirements of the individual firm rather than answering the question of when income is realized. As expressed by Gilman, the question which must be replied to in the affirmative is: "Will the relinquishment of merchandise result in cash or in the creation of an asset which, in the normal course of events, will be converted into cash?" [22] If a business firm, therefore, makes a sale to a customer and receives from the customer a long-term note, the income is nevertheless realized in the period of sale (unless some basis other than the usual sale is adopted). In handling a trade of merchandise for some readily salable shares of stock, however, the income is not realized until a subsequent transaction has taken place, i.e., the disposition of the shares of stock. The questions of (1) liquidity of the shares and (2) the intent of the party originally making the trade of merchandise have almost nothing to do with the realization of income. It is the present or future influence on cash that is the guiding consideration. If further effort must be expended in converting the property received into cash, no income is realized until the subsequent conversion.

**Income and saving distinguished.** Accountants have for many years discussed the question of whether a saving gives rise to realized income. The more modern view is that savings are adjustments to the cost price of an asset or service purchased by the individual business enterprise.[23] Under this view, a firm which has the opportunity of paying its purchase invoices within a certain time limit, and thereby is allowed to deduct a discount, has realized no revenue from the discount. The discount is a saving or a cost reduction rather than an income. There is, however, considerable authority to the contrary.[24]

The conclusion reached above, namely, that savings are not incomes,

[20] (1929) Canning 103.
[21] (1939) Gilman 101.
[22] (1939) Gilman 102.
[23] (1939) Gilman 370; (1940) Paton-Littleton 63.
[24] (1936) MacFarland-Ayars 38; (1936) Finney 96.

applies with equal force to all situations and transactions involving discounts, "lucky buys," and other similar fortunate acquisitions. The whole accounting scheme of income realization is postulated on the premise that sales (and not purchases) give rise to income. Adoption of any other basis is productive of possible absurd results. For example, if a firm, by some unusual circumstances, only purchased items during a certain period, and made no sales, it might show an income under the view that purchase discounts and other savings are reportable as revenue. The present writers prefer the opinion that discounts and fortuitous purchases simply give the individual firm an advantage of lower costs and expenses than are enjoyed by competitors or other enterprisers. This advantage may or may not be translated into more profit depending upon the many factors which influence or change that figure.

**Unusual problems of realization.** As explained previously, in by far the larger number of instances the question of when income is realized is determined by the accountant by reference to the sale basis. Comparatively little trouble arises in carrying out this goal in most of the day by day work of the accountant. Yet in some cases unusual problems may arise which tax the ingenuity of the accountant in their handling. Several of these [25] are discussed below.

*Trading merchandise for fixed assets.* While this type of transaction does not arise frequently, it is one which may be difficult to handle. Whenever a business entity disposes of its regular products for cash and a short time later places this cash in some piece of plant or equipment, there is no doubt in the minds of most accountants that income is realized upon the sale of the merchandise. In the case of a trade, however, there is only one transaction rather than two; the entity has not become possessed of cash or a claim for cash. Following, therefore, the standard of income realization developed earlier in this chapter, there is no realization of revenue in this case. The fixed asset acquired would be recorded on the books at the same figure previously used for the merchandise given up in exchange.

*Dividends received in property.* Property dividends are usually limited to two subvarieties: (1) merchandise and (2) securities of other companies. It has already been noted in Chapter 6 that for income tax purposes it is necessary as a general rule for the recipient of a property dividend to include in his tax return as income the fair market value of property dividends. Looking at the question in the light of the discussion in this chapter, however, only dividends in the form of bonds and notes would give rise to realized income since they are the only property dividends which are in the form of a cash claim. All the other types of property dividends should simply be taken up as an asset by the recipient at the same pro-

[25] Based on (1939) Gilman 106–114.

rata figure used by the corporation in recording the issue of the dividend. The credit would be to an unrealized income account. This conclusion is admittedly in direct opposition to the Treasury Department ruling. If the accountant, on the grounds of expediency, decides to follow the income tax rule, he should do so with full knowledge and appreciation of the fact that he is departing from the established standard of income realization.

*Donations.*[26] Donations of assets to private business firms are not frequently found. Yet when they take place an interesting aspect of income realization arises. In the case of a gift without any "strings" attached to it, no entry is absolutely required since there has been no exchange of values. Since the business firm has, however, an additional resource in its possession, some record should be made of the fact. The dollar amount used in this transaction might be some nominal sum, such as $1, or some larger figure closely approximating the fair market value. Assuming that the donated asset is a physical or intangible one not constituting a claim for cash, there is clearly no realization of revenue involved. The credit for whatever amount decided upon should be to the Donated Surplus account. If the asset is at a later date disposed of, an adjustment is made to the Donated Surplus account.

In the case of conditional gifts of property to the business firm, no formal entry is necessary pending the fulfilment of the conditions. One authority recommends that in this instance, say for a conditional gift which has the possibility of reverting to the donor during a five-year interval, the "prorata portion of the gift may be shown periodically by a charge to Donated Land or Equity in Land, offset by an equal credit to some suitable reserve account such as Donated Land Reserve or Unrealized Profit on Land. On the balance sheet, the reserve would be treated as a valuation reserve, no value being extended among the assets." [27] Obviously, this is a statistical technique which has merit underlying it.

*Buildings of lessee reverting to lessor.* Some lease contracts state that any improvements to the property made by the lessee revert to the lessor at the expiration of the lease. In a sense, therefore, the lessor receives property for which he makes no direct outlay. It is probable, however, that the knowledge of the future reversion is taken into consideration in setting the amount of the annual (or otherwise) payments to be made by the lessee. There may thus be an indirect consideration. The question that arises more pertinently at this point is whether the lessor realizes income from a transaction of this type, and if so, in what period is the income to be reported? It seems clear, following the tests for realization developed earlier in this chapter, that the owner of the property has no claim for cash during

[26] See Chapter 11 for a further discussion.
[27] (1933) Kester 361.

the life of the lease, in so far as the improvements are concerned, and, therefore, no realized income. At the expiration of the lease there is still no realized revenue, but since the lessor now possesses a resource which he previously did not have, it is in order that he take up the asset at its fair market value, crediting the same to Unrealized Improvements to Leased Property account. In this connection the Treasury Department [28] has ruled:

> Income derived by a lessor of real property upon the termination, through forfeiture or otherwise, of the lease of such property and attributable to buildings erected or other improvements made by the lessee upon the leased property is excluded from gross income. However, where the facts disclose that such buildings or improvements represent in whole or in part a liquidation in kind of lease rentals, the exclusion from gross income shall not apply to the extent that such buildings or improvements represent such liquidation. The exclusion applies only with respect to the income realized by the lessor upon the termination of the lease and has no application to income, if any, in the form of rent, which may be derived by a lessor during the period of the lease and attributable to buildings erected or other improvements made by the lessee. It has no application to income which may be realized by the lessor upon the termination of the lease but not attributable to the value of such buildings or improvements. Neither does it apply to income derived by the lessor subsequent to the termination of the lease incident to the ownership of such buildings or improvements.

*Accretion.* The question of accretion is closely associated with the whole problem of whether production gives rise to realized revenue. It may be asked, therefore, whether the natural increase in nursery stock, growing timber, stocks of animals, fish, and orchard productivity becomes realized income over the periods in which the increase takes place. Most accountants insist that such accretion simply adds to the entity resources without becoming a recognizable revenue. It may be recorded period by period, assuming that it can be measured (such as in the case of nursery stock), but the credit should be to an unrealized revenue account of some appropriate title. There is, however, some authority to the contrary. For instance, two accountants state that accretion is "in the nature of a capital gain and may be recorded by debiting the asset involved and crediting an account entitled 'Income from Accretion.'" [29] Again, in connection with standing timber, one authority suggests that the accretion becomes realized because "the increased value, if unquestioned, is akin to the increasing value of a discounted note which by most authorities is counted as income available for dividends even though it has not as yet been converted into cash." [30] The analogy to the discounted note is not exactly apropos, since

[28] *Regulations 111*, Section 29.22 (b) (11)–1.
[29] (1935) Husband-Thomas 552.
[30] (1927) Hatfield 253.

income is realized on the note because of its inherent possible claim for cash, and not necessarily because, *per se*, it is growing in value.

It should be observed that in some instances accretion comes about through the expenditure of considerable sums of money for improvements and other necessary physical maintenance items. In the event that periodic accretion is viewed as unrealized income pending disposal of the property, it is logical to defer the outlays incurred in maintaining and improving the property during the time of its ownership. These outlays and charges will be offset against the sale price at the time of disposition.

The whole problem of accretion is particularly pertinent in connection with the reporting of taxable income of farmers. In regard to this problem the Treasury Department[31] has ruled:

A farmer reporting on the basis of receipts and disbursements (in which no inventory to determine profits is used) shall include in his gross income for the taxable year (1) the amount of cash or the value of merchandise or other property received during the taxable year from the sale of live stock and produce which were raised during the taxable year or prior years, (2) the profits from the sale of any live stock or other items which were purchased, and (3) gross income from all other sources. The profit from the sale of live stock or other items which were purchased after February 28, 1913, is to be ascertained by deducting the cost from the sales price in the year in which the sale occurs, except that in the case of the sale of animals purchased as draft or work animals or solely for breeding or dairy purposes and not for resale, the profit shall be the amount of any excess of the sales price over the amount representing the difference between the cost and the depreciation theretofore allowed (but not less than the amount allowable) in respect of such property as a deduction in computing net income.

In the case of a farmer reporting on the accrual basis (in which an inventory is used to determine profits), his gross profits are ascertained by adding to the inventory value of live stock and products on hand at the end of the year the amount received from the sale of live stock and products, and miscellaneous receipts for hire of teams, machinery, and the like, during the year, and deducting from this sum the inventory value of live stock and products on hand at the beginning of the year and the cost of live stock and products purchased during the year. In such cases all live stock raised or purchased for sale shall be included in the inventory at their proper valuation determined in accordance with the method authorized and adopted for the purpose. Also live stock acquired, for draft, breeding, or dairy purposes and not for sale, may be included in the inventory, instead of being treated as capital assets subject to depreciation, provided such practice is followed consistently by the taxpayer. In case of the sale of any live stock included in an inventory their cost must not be taken as an additional deduction in the return of income, as such deduction will be reflected in the inventory.

**Worksheet for determining amount of guaranteed income.** In some instances, preferred stocks and bonds are issued with an accompanying agreement (from another corporation) calling for the maintenance of a guaranteed amount or percentage of income in relation to the interest, divi-

[31] Regulations 111, Section 29.22 (a)–7.

dends, or principal on the stocks or bonds being sold. Such an agreement, of course, will make the stocks or bonds more desirable to prospective buyers of securities. It is customary for a closely related affiliate, such as a parent corporation or a sponsoring firm, to offer to sign the agreement.

There are many varieties of the type of contract contemplated in this section; space does not allow an extensive description of all of them here. One of the more common types involves the determination of the so-called "cash income" of the issuing corporation. Since most firms do not ordinarily determine their periodic income on a cash basis, but rather the accrual basis, the problem arises as to how the "cash income" can be readily calculated. The following illustrative problem and its solution are presented to indicate not only a typical contract of this sort, but also the recommended technique for handling situations of this kind.

### *Illustrative Problem*

Parathon Distributing Company is a wholly owned subsidiary of Paragon Mills, Inc., and was organized in 1948 as the western outlet of its parent. Most of the capital necessary for establishing the subsidiary was derived from an issue of 4½% income bonds, dated July 1, 1948, interest payable annually on January 1. The bond indenture provides as follows:

Commencing with the calendar year 1951 Paragon guarantees that the net earnings of Parathon shall be not less than 200 per cent of the interest falling due on this issue each year. "Net earnings" are hereby defined to mean the excess of cash received over cash disbursed before interest deductions. Paragon further guarantees that if bonds of this issue are outstanding at the end of any calendar year, the value, not exceeding market, of the net tangible assets [32] of Parathon shall not be less than 150 per cent of all Parathon's funded debt. Parathon shall, upon determining the existence of either or both these deficiencies, bill Paragon for the total amount thereof and shall adjust its balance sheet in such a manner as to reflect such guarantees. Paragon shall pay the billed amount to Parathon within a period not greater than 30 days after the date of such billing.

Additions to buildings and equipment as shown by the books totaled $14,200 for the year. Certain building improvements amounting to $2,428 were also made during the year, but were erroneously charged to operating expenses. Equipment costing $6,700 had been retired, $4,172 depreciation had accrued thereon, and the Property account as well as the Reserve for Depreciation had been properly adjusted.

[32] Includes all assets except deferred charges less valuation reserves and current liabilities.

The following trial balances of Parathon are submitted:

| | December 31, 1950 after closing | December 31, 1951 before closing |
|---|---|---|
| Building and Equipment (at cost) | $235,100 | $ 242,600 |
| Inventories (at cost) | 22,940 | 89,434 |
| Customers' Accounts | 246,510 | 302,496 |
| Cash | 252,465 | 183,522 |
| Unamortized Debt Discount | 25,000 | 23,000 |
| Dividend Paid | ..... | 15,000 |
| Merchandise Sold (purchased from Paragon) | ..... | 1,885,286 |
| Operating Expenses | ..... | 868,318 |
| Depreciation Expense | ..... | 12,581 |
| Bad Debts | ..... | 31,040 |
| Property and Income Taxes | ..... | 8,905 |
| Interest Expense | ..... | 22,500 |
| Amortized Debt Discount | ..... | 2,000 |
| | $782,015 | $3,686,682 |
| Accounts Payable (for operating expenses) | $119,750 | $ 126,886 |
| Accrued Taxes | 37,767 | 12,189 |
| Accrued Interest | 22,500 | 22,500 |
| Reserve for Depreciation | 15,238 | 23,647 |
| Reserve for Doubtful Accounts | 8,500 | 36,200 |
| Common Capital Stock | 10,000 | 10,000 |
| Income Bonds (due July 1, 1963) | 500,000 | 500,000 |
| Earned Surplus | 68,260 | 68,260 |
| Sales | ..... | 2,887,000 |
| | $782,015 | $3,686,682 |

Prior years' bad debts written off in 1950 were recovered in 1951 to the amount of $1,260, which was credited to the reserve, and of the 1950 customers' accounts $4,600 was charged off. All remaining 1950 balances were collected.

The market value of the opening inventory exceeded cost; the closing inventory was carried at $22,510 in excess of market.

The trustee of the bonds has called for a statement of Parathon's financial position.

Prepare:

a. Parathon's balance sheet of December 31, 1951, adjusted in accordance with the terms of the bond indenture.

b. A summary of Parathon's receipts and disbursements in 1951, showing computations.

c. A computation of the amount to be refunded by Paragon under the terms of the indenture. (American Institute, adapted)

NOTE. To save space, a work sheet is submitted in lieu of requirements (a) and (b).

*Solution*

| | 12/31/50 after closing | 1951 Non-Cash Transactions | | 1951 Cash Transactions | | 12/31/51 Corrected before closing | Adjustments | | 12/31/51 Balance Sheet |
|---|---|---|---|---|---|---|---|---|---|
| | Debit | Debit | Credit | Debit | Credit | Debit | Debit | Credit | Debit |
| Building and Equipment | $235,100 | ..... | A $ 6,700 | $ 2,428 | ..... | $ 245,028 | ..... | ..... | $245,028 |
| | ..... | ..... | ..... | 14,200 | ..... | ..... | ..... | ..... | ..... |
| Inventories | 22,940 | ..... | F 22,510 | 1,951,780 | ..... | 66,924 | ..... | ..... | 66,924 |
| | ..... | ..... | G 1,885,286 | ..... | ..... | ..... | ..... | ..... | ..... |
| Customers' Accounts | 246,510 | D $2,887,000 | C 4,600 | ..... | $2,826,414 | 302,496 | ..... | ..... | 302,496 |
| Cash | 252,465 | ..... | ..... | ..... | 68,943 | 183,522 | ..... | ..... | 183,522 |
| Unamortized Debt Discount | 25,000 | ..... | H 2,000 | ..... | ..... | 23,000 | ..... | ..... | 23,000 |
| Dividend Paid | ..... | ..... | ..... | 15,000 | ..... | 15,000 | ..... | N $ 15,000 | ..... |
| Merchandise Sold | ..... | F 22,510 | ..... | ..... | ..... | 1,907,796 | ..... | M 1,907,796 | ..... |
| | ..... | G 1,885,286 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Operating Expenses | ..... | A 2,528 | ..... | ..... | ..... | 865,890 | ..... | M 865,890 | ..... |
| | ..... | B 863,362 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Depreciation Expense | ..... | I 12,581 | ..... | ..... | ..... | 12,581 | ..... | M 12,581 | ..... |
| Bad Debts | ..... | E 31,040 | ..... | ..... | ..... | 31,040 | ..... | M 31,040 | ..... |
| Property and Income Taxes | ..... | J 8,905 | ..... | ..... | ..... | 8,905 | ..... | M 8,905 | ..... |
| Interest Expense | ..... | K 22,500 | ..... | ..... | ..... | 22,500 | ..... | M 22,500 | ..... |
| Amortized Debt Discount | ..... | H 2,000 | ..... | ..... | ..... | 2,000 | ..... | M 2,000 | ..... |
| Due from Paragon | ..... | ..... | ..... | ..... | ..... | ..... | L $ 173,452 | ..... | 173,452 |
| | $782,015 | | | | | $3,686,682 | | | $994,422 |
| | Credit | | | | | Credit | | | Credit |
| Accounts Payable (for operating expenses) | $119,750 | ..... | B 863,362 | 856,226 | ..... | $ 126,886 | ..... | ..... | $126,886 |
| Accrued Taxes | 37,767 | ..... | J 8,905 | 34,483 | ..... | 12,189 | ..... | ..... | 12,189 |
| Accrued Interest | 22,500 | ..... | K 22,500 | 22,500 | ..... | 22,500 | ..... | ..... | 22,500 |
| Reserve for Depreciation | 15,238 | A 4,172 | I 12,581 | ..... | ..... | 23,647 | ..... | ..... | 23,647 |
| Reserve for Doubtful Accounts | 8,500 | C 4,600 | E 31,040 | ..... | 1,260 | 36,200 | ..... | ..... | 36,200 |
| Common Capital Stock | 10,000 | ..... | ..... | ..... | ..... | 10,000 | ..... | ..... | 10,000 |
| Income Bonds | 500,000 | ..... | ..... | ..... | ..... | 500,000 | ..... | ..... | 500,000 |
| Earned Surplus | 68,260 | ..... | ..... | ..... | ..... | 68,260 | ..... | N 21,288 | 89,548 |
| Sales | ..... | ..... | D 2,887,000 | ..... | ..... | 2,887,000 | M 2,887,000 | ..... | ..... |
| Paid-in Surplus | ..... | ..... | ..... | ..... | ..... | ..... | ..... | L 173,452 | 173,452 |
| Profit and Loss | ..... | ..... | ..... | ..... | ..... | ..... | N 36,288 | M 36,288 | ..... |
| | $782,015 | $5,746,484 | $5,746,484 | $2,896,617 | $2,896,617 | $3,686,682 | $3,096,740 | $3,096,740 | $994,422 |

**Computation of Amount To Be Refunded by Paragon Mills, Inc.**

| | | | |
|---|---|---|---|
| Interest Due in 1951: | | | |
| 4½% × $500,000 | | $ 22,500 | |
| Guaranteed Earnings: 200% of above | | $ 45,000 | |
| Excess of disbursements over receipts | $ 68,943 | | |
| Less interest paid during year | 22,500 | 46,443 | $ 91,443 |
| Cash | | $183,522 | |
| Customers' Accounts | | 302,496 | |
| Inventories, at cost | $ 89,434 | | |
| Less: Market decline | 22,510 | | |
| Inventories, at lower value | | 66,924 | |
| Buildings and Equipment | $242,600 | | |
| Improvements | 2,428 | 245,028 | |
| Due from Paragon (above) | | 91,443 | |
| | | $889,413 | |
| Accrued Taxes | | $ 12,189 | |
| Accrued Interest | | 22,500 | |
| Reserve for Depreciation | | 23,647 | |
| Reserve for Doubtful Accounts | | 36,200 | |
| Accounts Payable | | 126,886 | |
| | | $221,422 | |
| Net Tangible Assets | | $667,991 | |
| 150% of Parathon's Funded Debt: | | | |
| 150% × 500,000 | | $750,000 | |
| Less: Net Tangible Assets | | 667,991 | |
| Additional Due from Paragon | | | 82,009 |
| Total Due from Paragon | | | $173,452 |

# CHAPTER 13

## Periodicity Factor and Business Income

**Importance of the problem of income periodicity.** Modern accountants are peculiarly concerned with the problem of determining business income by periods of time. In earlier days this emphasis was not so readily apparent. As explained in the preceding chapter, so long as accountants were interested primarily in where the wealth of a particular person (or a particular business) lay, there was little need and little effort to determine any more than by the roughest of approximation the periodic progress of the individual firm. At one time business activities were viewed as a series of ventures, a new one starting off afresh after the expiration of the previous arrangement. While this perspective still exists in certain situations today, it no longer retains any fundamental realism. The typical business firm at the present time does not expire at the end of any predetermined time interval, and neither does it operate by fits and starts. Today, intermittency is important only in the case of contractors who engage in long-term construction. The revenue stream, therefore, of most enterprises is continuous, and for any given business unit there is so much standardization and uniformity in the transactions which come up day by day that periodic business income can no longer be determined under the old assumed liquidation test.

Along with the growth of uniformity and continuity in business has come the gradual separation of ownership and management, especially in the large corporation. Periodic reports as to progress have become increasingly necessary for the determination of the effectiveness with which the entity resources are managed. As is widely known it has also become customary for businessmen to divide fiscal reporting into equal periods of time called the "accounting period." The accounting period convention of regularly reporting revenue and expired costs, assets and liabilities, and other financial data has grown to be so important as to be fundamental to the accounting process. For example, one authority has gone so far as to state that the problem "of capital and revenue expenditures is the central problem of accounting, and, since it springs from the convention of accounting periods, it follows that the convention itself is dominant in accounting." [1] Again, another authority has stated that accounting "might almost be defined as the art which attempts to break up the financial history of a business into specific units, a year or less in length." [2] Both of

[1] (1939) Gilman 96.
[2] (1922) Paton 469.

these quotations emphasize the fact that most of the efforts of the modern accountant are centered around the problems associated with the periodicity of business income. Today, the question of the appropriate offsetting of expired costs, expenses, and losses against revenues is one of inestimable importance. Because of income taxes, if for no other reason, it is probable that there are going to be continued greater efforts by accountants and business managers to control costs and incomes as well as to match these items periodically in such manner as will give the most useful knowledge as to the progress of the individual firm. There are, therefore, no limits to the implications of this in contemporary accounting practice.

**The matching problem — general.** The periodic offsetting of realized revenues against the expired costs, expenses, and losses associated with these revenues (as well as the "period" charges) is referred to in modern accounting as the "matching problem." There is general agreement among accountants as to the fundamental necessity of attempting to attain the matching goal. However, opinion has not crystallized as to some of the subobjectives involved in the problem. For example, consideration is given, and probably always will be given, to the various doctrines of accounting, such as practicality, conservatism, materiality, consistency, and disclosure. All of these become pertinent to any discussion and "solution" to the matching problem.

While matching has as its primary purpose the determination of the interim progress (or lack of progress) of the individual business unit, there is no definite agreement among accounting authorities as to what is meant by progress. As mentioned in the preceding chapter, two different views are available which, because of their significance, are quoted below:

> One of the concepts is that net income for the year should be measured by deducting from the accumulated net income up to the end of the year the amount accumulated up to the beginning of the year. Another, and an entirely different concept, is one which emphasizes the relationship of items to the operations, and to the year, excluding from the income account any important items which are not so related.[3]

The first of the two preceding concepts has been called the "historical" concept of the matching process. The second is referred to as the "earning power" concept. Under the historical concept, emphasis is placed on the proposition that a series of income statements should reflect all realized revenues and offsets, and that the "currentness" of the items is only of secondary interest. The important thing is that the item was discovered or arose during the particular fiscal period in which it is reported. This makes the matter essentially historical in nature, since no great significance

[3] Unsigned article, 80 *Journal of Accountancy* 206.

is attached to the question of what may be counted on or reasonably predicted for the future.

The earning power view is that periodic business income, or the measurement of progress, is concerned only with those items of realized revenue and offsets which can be associated with the determination of the earning power of the firm. This concept is one, therefore, which has a definite futuristic tinge; it is implied that the business income is only the ordinary, reasonable-to-expect items.

The decision as to which of the preceding concepts offers the greater use and advantages has been the subject of much discussion in accounting circles in recent years. The gist of the several treatments which have been suggested is illustrated later in this chapter.

**Techniques for matching.** In the development of the techniques for attaining the matching goal, accountants have developed two approaches. The first is referred to as the cost accounting viewpoint. In a complete cost accounting system, the accountant accumulates the cost of the material, labor, and burden applicable to the product worked on each day, week, or month. It is assumed that these costs attach themselves to the product and become part and parcel of it. As the product flows through the factory operations, the costs accumulate. When the product is finished, an entry is made giving the Work in Process account credit for the cost of the completed items and charging an asset account, Finished Goods. In turn, as the product is sold, Finished Goods is credited and Cost of Sales account is debited. The matching of realized sales revenues against the factory cost of sales occurs at this latter point. Most accountants have traditionally considered that this technique of matching is, relatively speaking, much more accurate than in the case where no cost system is employed. However, it should not be overlooked that some of the assumptions of cost accounting are arbitrary and that this may give rise to erroneous impressions as to the specific accuracy of costs.[4] This observation is especially pertinent in connection with the treatment of the burden element of factory cost of production. The depreciation cost pertaining to a machine, for example, can hardly be said to pertain to any certain unit of production; yet under orthodox cost systems some of the depreciation is assigned to specific units of output.

The second technique for matching applies to situations where cost accounting systems are not employed — the general accounting possibilities. The gist of this technique has been aptly stated by one authority as follows:

> When the general accountant, as distinguished from the cost accountant, speaks of matching costs and income, he usually refers to their inclusion in the same ac-

[4] *N.A.C.A. Bulletin*, Volume 27, Number 18, Section II.

counting period, not to the direct relation of specific items of income to specific items of cost-outlay. This is a different problem from that of the cost accountant. While it is probably no more accurate, at least it does not present any fictitious appearance of accuracy.[5]

In both the cost accounting and the general accounting techniques of matching, there are many perplexing decisions which must be made in attempting to attain the goal involved. These decisions are centered around what may be called "time and amount uncertainties." [6] The latter have reference to the fact that some periodic expired costs and expenses are indeterminate, except in the light of long-time retrospection. An excellent example of this occurred during the years of World War II. Many business firms were conscious of the problem of whether or not recognition should be taken during the war years of the probable cost of reconversion to peacetime activities and also of the losses occasioned by the abandonment of war production. It can easily be seen that these items would be uncertain as to both time and amount. In some instances, the charge is indeterminate only as to the time of appropriate matching against revenue, while in other cases it may be doubtful as to amount. It must be admitted that up to the present time many of the decisions rendered on this important accounting matter have been based to a large extent upon what may be called practical considerations, conservatism, and expediency. For example, the outlay for a national advertising campaign can be approximately allocated to accounting periods in which the resulting realized sales revenues are obtained, but seldom are business people willing to keep the records necessary for such allocation, especially as the Bureau of Internal Revenue will not permit such items to be carried as a deferred asset and charged off over a period of years.[7] In summary, the matching of each unit of expired cost or expense against each unit of revenue is the Utopian standard which is sought in accounting, but of course perfection will never be achieved. Considerable progress has been made, however, in the past decade in regard to the delineation of the problem.

**Costs, expenses, and losses.** Even in a partially exhaustive treatment of the periodicity factor and business income the question of the possible distinction between costs, expenses, and losses arises. Various suggestions have been made relative to the underlying notions, such as: "Expenses are those costs which are identified with particular streams of current output as distinct from those costs (deferred charges) which will normally be identified with future streams of output. Costs which cannot logically be identified with any output, either past, present, or future, are losses." [8]

[5] (1939) Gilman 127.
[6] (1929) Canning 98; Blocker, 24 *Accounting Review* 33.
[7] O.D. 1039, V C.B. 130.
[8] Bangs, 15 *Accounting Review* 361.

Again, "the term 'expense' has been given many divergent meanings. Sometimes it is used as synonymous with cost, a generic term having no distinct technical meaning except as qualifying the words attached. More often it is used to refer to cost of services (as against cost of tangible goods), especially those service costs incidental to selling, administration, and financial activities. The term is also applied to the costs assignable to a particular quantity of revenue. Many would agree that this third usage — expense as the over-all cost of revenue — is the most significant for accounting purposes." [9]

While each accountant has a general conception of the nature of costs, expenses, and losses, the present authors prefer (1) to use the term "cost" to refer to an outlay or charge resulting in a recordable asset; (2) to use the term "expired cost" to refer to the amortization or periodic matching of the asset cost against realized revenue; (3) to use the term "expense" to refer to an outlay or charge giving rise to, or associated with, realized revenue, the charge not having previously been recorded as an asset; (4) to use the term "loss" to refer to a cost expiration which cannot be associated with the obtaining of any realized revenue. The terms "expired cost" and "expense" are thus rather similar in nature, both being closely identified with the production of gross revenue. The distinction between them lies mainly in the source of the original charge giving rise to the item. If the original charge is first reportable as an asset, such as inventories and fixed assets, the amount of the asset matched against periodic revenue would be the expired cost item. If, on the other hand, the original charge has no asset quality at the time of its incurrence, such as many types of repairs, salaries and wages, taxes, delivery charges, and advertising, the amount matched against periodic revenue would be an expense item.

It is admitted that the preceding distinction between expired cost, expense, and loss is not always considered necessary in the preparation of statements of income. The present authors believe, however, that such a differentiation has merit; it will serve to clarify some of the thinking involved in determining periodic business income. In addition, since the entire accounting process is essentially concerned with itemization and classification, any delimiting of terminology should be helpful in making accounting reports more useful.

**Relation of conservatism to periodic income.** Accountants traditionally have placed a great deal of emphasis on what they call "conservatism in accounts" and "conservative business policy." Many accounting decisions have been made based on the particular notion of conservatism held by the individual accountant. In this connection, it is interesting to observe that while the doctrine of conservatism has (and does) permeate much

[9] Chow, 14 *Accounting Review* 340.

accounting thinking, very few persons have ever attempted to explain the reasoning underlying it. As one authority has cogently put it:

> Conservatism is one of those vague but sanctified concepts like honesty, morality, democracy, and Nordic supremacy, so much so that its critics generally consider it necessary to tread lightly as if on holy ground. Accordingly but little real effort has been made to measure the effects of conservatism.[10]

The essence of conservatism as it relates to accounting is reflected in the phrase "provide for all losses; anticipate no gains." [11] This, of course, is an admonition which is subject to as many interpretations as there are accountants. In practice, therefore, many varying degrees of conservatism are found. In regard to "gains," the conservative accountant adopts a pessimistic view concerning any revenues not yet collected in cash and establishes a very liberal allowance for bad accounts. On the opposite side of the matching picture, the conservative accountant accrues all possible expenses associated with the revenue for the period as well as writing off all costs whose future revenue producing usefulness may be in any doubt. The accounting techniques for carrying out conservatism are fairly numerous, ranging all the way from secret reserves to openly stated charges against periodic revenue for anticipated items. Specifically, the methods ordinarily employed are: (1) charging expenditures for fixed assets to expense accounts, (2) charging off an ultraliberal amount for depreciation, (3) taking account of price declines in inventory and investments, (4) taking account of contingent liabilities in some way in the accounts, but not considering contingent assets, (5) creating a multiplicity of earned surplus reserves for all kinds of contingencies, and (6) writing off immediately after original recordation such items as bond discount, organization costs, goodwill, and other intangibles.

From what has been stated above, it should be readily appreciated that the conscious adoption of the doctrine of conservatism is opposed to the most objective attitude toward carrying out the accounting goal of matching revenues against expired costs and expenses. The application of conservatism to accounting decisions also substitutes for the objective-as-possible determination of periodic business income the most subjective attitude conceivable, since there are almost no limits to the extent to which conservative techniques may be employed in practice.[12] This ultimately means that no standards of accounting could be formulated; each business entity would be a separate "law" to itself.

Any trend toward the reduction in emphasis on the dictum of conservatism does not necessarily mean that the responsibility of the accountant is thereby reduced. It means rather that the attainment of a "conservative

[10] (1939) Gilman 232.
[11] Littleton, 21 *Accounting Review* 216.
[12] Paton, 89 *Journal of Accountancy* 18.

policy" would no longer be one of the goals of the accounting process. Instead of making decisions based on some interpretation of conservatism, the accountant would rely more on the best possible objective and factual determination of the revenues, expired costs, expenses, and losses associated with the fiscal period under consideration. It is the change of thinking (or emphasis), therefore, that would be significant. The almost mechanical adoption, for example, of the "cost or market, whichever is lower" rule for pricing inventory is an attempt to apply a formulism to the carrying out of the conservative policy which ignores the effect of such a rule on the amount of periodic reported net income. Again, the same is true of the often

with the attendant ambiguity which is associated with this phrase.

In view of the increased emphasis which in recent years has been placed on the periodic statement of income, it is the opinion of the present authors that the doctrine of conservatism offers too many possibilities for inconsistency and arbitrary application for it to be accorded much significance in carrying out the accounting process in the present-day business economy. Conservatism is deeply rooted, however, and a large segment of the profession will probably continue to adhere to it for some time to come.

**Inventory realization in relation to periodic income.** In periods of severe, as well as moderate, fluctuation of commodity prices, significant questions may arise in regard to their effect on the determination of periodic business income. For discussion purposes, the principal effects may be divided twofoldly: (1) When inventories are acquired, either by purchase or manufacture, at different prices per unit, what theory of matching (of expired inventory cost against revenue) should be adopted by the accountant if, as is usually the case, some of the items remain on hand at the end of the fiscal period? (2) If, at the end of any given fiscal period, the replacement cost of the items of inventory still on hand differs from the historical cost (either specific or derived), should this difference be taken into consideration in carrying out the matching process for calculating the periodic net business income? Both of these questions have been treated at length by accountants in recent years.[13] No definitive answers have been formulated up to the present time, and it is entirely possible that the matters will always remain controversial. However, some of the issues have been clarified.

The way that inventory pricing problems are settled may have an important effect on both the income of each period and the balance sheet

[13] Devine, C. T., *Inventory Valuation and Periodic Income* (New York: Ronald Press Co., 1942), entire book; Gaa, "Effect of Inventory Methods on Calculation of Profits and Income Taxes," *University of Illinois Bulletin*, February 9, 1943.

presentation. Several lines of reasoning may be adopted for determining the allocation of the cost of goods available for sale between the inventory still on hand and the expired cost of sales, assuming that detailed records exist which afford the data necessary for making the division; this information is usually maintained by the medium to large business units. The prominent methods for carrying out the allocated cost are: (a) specific lot or actual identification; (b) end-of-a-time-period weighted average cost; (c) weighted moving average; (d) first-in, first-out; (e) last-in, first-out; and (f) standard cost method. Each of these has been widely discussed and illustrated during the last few years. It is recognized that given a long enough period of time it may make little difference which method is selected. Periodic business income is all-important, however, and its approximate determination constitutes the essence of the accounting process. Several authorities have prepared elaborate illustrations of the possibilities for variation in reported income depending upon the pricing method employed in a given situation. These illustrations, while hypothetical, show the tendencies inherent in the problem. The results of one thorough study [14] are given in the two tables below:

**Net Income Figures Resulting from Application of Different Inventory Methods**

| Year | First-in, First-out | Average Cost | Last-in, First-out |
|---|---|---|---|
| 1920 (War Prosperity) | $ 15,312 | $ 14,304 | $ 13,329 |
| 1921 | $ 4,898* | $ 1,547 | $ 8,819 |
| 1922 | 4,793 | 4,172 | 9,764 |
| 1921–1922 (Depression) | $ 105* | $ 5,719 | $ 18,583 |
| 1923 (Prosperity) | $ 10,489 | $ 7,628 | $ 9,588 |
| 1924 (Depression) | $ 7,437 | $ 6,706 | $ 7,743 |
| 1925 (Prosperity) | $ 11,717 | $ 9,257 | $ 8,001 |
| 1926 (Prosperity) | 7,640 | 9,646 | 10,400 |
| 1927 (Downswing) | 7,425 | 7,751 | 8,811 |
| 1928 (Prosperity) | 9,986 | 8,964 | 8,975 |
| 1929 (Prosperity) | 8,966 | 9,269 | 9,652 |
| 1925–1929 (Prosperity) | $ 45,734 | $ 44,887 | $ 45,839 |
| 1930 | $ 4,593 | $ 6,588 | $ 9,458 |
| 1931 | 2,824 | 5,249 | 9,894 |
| 1932 | 3,946 | 4,520 | 7,907 |
| 1933 | 8,318 | 6,853 | 9,440 |
| 1930–1933 (Depression — Decline) | $ 19,681 | $ 23,210 | $ 36,699 |
| 1934 | $ 12,037 | $ 8,890 | $ 8,395 |
| 1935 | 14,478 | 11,875 | 9,917 |
| 1936 | 11,313 | 11,454 | 9,647 |
| 1934–1936 (Depression — Upswing) | $ 37,828 | $ 32,219 | $ 27,959 |
| 1937 (Downturn) | $ 11,757 | $ 11,554 | $ 9,777 |
| 1920–1937 | $148,133 | $146,227 | $169,517 |

* Loss.

[14] Taken from Gaa, *op. cit.*, p. 25.

**Closing Inventory Figures Resulting from Application of Different Inventory Methods**

| Year | First-in, First-out | Average Cost | Last-in, First-out |
|---|---|---|---|
| 1920 (War Prosperity) | $51,005 | $49,997 | $49,022 |
| 1921 (Depression) | 41,880 | 47,317 | 53,614 |
| 1922 (Depression) | 33,377 | 38,193 | 50,082 |
| 1923 (Prosperity) | 37,036 | 38,991 | 52,840 |
| 1924 (Depression) | 40,244 | 41,468 | 56,354 |
| 1925 (Prosperity) | 43,960 | 42,724 | 56,354 |
| 1926 (Prosperity) | 42,800 | 43,570 | 57,954 |
| 1927 (Downswing) | 44,116 | 45,212 | 60,656 |
| 1928 (Prosperity) | 46,713 | 46,787 | 62,242 |
| 1929 (Prosperity) | 46,807 | 47,184 | 63,022 |
| 1930 (Depression — Decline) | 42,954 | 45,326 | 64,034 |
| 1931 (Depression — Decline) | 32,120 | 36,917 | 60,270 |
| 1932 (Depression — Decline) | 24,643 | 30,014 | 56,754 |
| 1933 (Depression — Decline) | 23,121 | 27,027 | 56,354 |
| 1934 (Depression — Upswing) | 28,409 | 29,168 | 58,000 |
| 1935 (Depression — Upswing) | 31,598 | 29,754 | 56,628 |
| 1936 (Depression — Upswing) | 32,599 | 30,896 | 55,963 |
| 1937 (Downturn) | 37,293 | 35,387 | 58,677 |

The above figures for a manufacturing firm, while hypothetical, were based on published index numbers and other basic data relating to prices and volume of output. This has the effect of making them much more realistic than would otherwise be the case.

Even from a very quick inspection of the above tables, it is apparent that from the standpoint of both the income statement and the balance sheet serious differences appear depending upon the choice of allocation method. Not all firms are equally affected, of course, because of individual peculiarities in regard to such influences as volume of output, flexibility of selling prices, monopolistic conditions, etc.

In making a decision as to which particular pricing technique to use in any given case, the accountant is guided by considerations such as the following:

1. In what way does the product actually (physically) flow into production and sales; that is, are the oldest units disposed of first, or are the newest units disposed of first, or are the items acquired at different times mixed together in such a way as to make them indistinguishable from the standpoint of determining disposal priority?

2. Which method, or methods, have the tendency to "smooth out" the reported periodic progress figures for the individual business firm? This important topic is treated more at length in the next chapter of this text.

3. Which method provides the most conservative (lowest in dollar amount) inventory figure for the end-of-period balance sheet?

4. Which method provides the most useful type of cost of production and cost of sales figures for control and internal management purposes?

5. Which method provides the most useful figure for aid in determining selling prices, in so far as selling prices may be influenced by expired costs and expenses?

6. Which method comes closest to carrying out the concept of historical accounting?

Many arguments, both pro and con, have been pointed out concerning the considerations given above. Space does not allow an exhaustive review of all of them in this chapter. The specific lot and first-in, first-out methods have been given active support by prominent authorities; [15] however, the last-in, first-out method has been favored in many instances in recent years on the broad grounds that accountants should sponsor techniques which will have the effect of reducing the periodic fluctuations in reported net income of each business unit. Accounting standards, therefore, have not crystallized on this matter up to the present time. Moreover, in view of the compelling quality of the several considerations given above, it is going to be an unusually troublesome task to formulate appropriate standards in the future. Experiential accounting may call, for example, for the use of one method of allocation, while accounting-a-tool-of-management may call for another method. These aspects make the choice of method extraordinarily abstruse.

*Inventory replacement cost and periodic income.* As observed in a previous section of this chapter, a considerable number of the "rules" and "practices" of accounting originated in the desire to be conservative. This dictum was fostered to a large extent by the creditor emphasis in statement preparation; that is, the individual business creditor in his desire to "play safe" ordinarily takes a rather pessimistic view toward the possibility of repayment. Many accounting reports in former decades were prepared with the creditor emphasis in mind. This was particularly the case in regard to the balance sheet, and especially in connection with the presentation of the so-called "current assets." Inventory on hand at the date of the balance sheet was, and to a large extent still is, viewed as a debt-paying medium. The opposite view that inventory constitutes a cost awaiting the matching process has been emphasized only in recent years. As long as the current asset aspect of inventory predominates, with its emphasis on liquidation-to-satisfy-creditors, attention will be given to the use of replacement cost, or "market," in connection with the stating of the inventory on the balance sheet.

[15] (1940) Paton-Littleton 78–80.

Accountants traditionally have taken the position that on the grounds of conservatism it is desirable to state the inventory on the balance sheet at cost or market, whichever is lower; the term "market" here refers to replacement cost rather than selling price. The supposition also is that the adoption of this rule results in a lower net income for the fiscal period than would otherwise be the case. However, as has been pointed out by several authorities, the last supposition is not necessarily an established fact, depending upon the circumstances in each firm (see illustrations below).

Due perhaps to a lack of primary data, the full implications of the rule of cost or market, whichever is lower, have not been adequately explored. Then, too, even though there is evidence of the use of the rule as far back as 1712,[16] there is still a great deal of doubt as to the appropriateness of admitting the rule as an accounting standard.[17]

From the standpoint of applying the rule in practice, several variations appear. Where perpetual inventories are not maintained, the inventory on hand at any statement date is usually priced at the lower of cost or market (by specific items), the result being that the write-down, if any, of the inventory is automatically reflected in the cost of sales figure for the fiscal period. Some accountants modify the handling of the write-down by segregating it in a separate account which is closed to Profit and Loss; this separate account is presented on the income sheet in some caption below cost of sales, usually as a nonoperating charge. Still other accountants do not actually write down the Inventory on Hand account, setting up instead an earned surplus reserve for the amount of write-down; this reserve is deducted from the cost of the inventory for balance sheet purposes. In this latter treatment, the periodic income is not affected by the adoption of the "cost or market, whichever is lower" rule.

If perpetual inventories are maintained, two practices are in use. Under the first, the several inventory cards are adjusted downward in dollars if the market is lower than cost, the debit being to a Loss on Inventory Price Decline account. The latter account is presented on the income statement as an addition to cost of sales or as a nonoperating item. Under the second practice, a Reserve for Price Decline in Inventory account is set up to handle the write-down figure as a credit, the debit in turn being to Loss on Inventory Price Decline account. The purpose underlying this second practice is to avoid having to "tamper" with the several individual inventory stock cards; in addition, the cost of sales and cost of production are not disturbed by any write-downs of the inventory.

In order to illustrate the effect on periodic income if the rule of cost or market, whichever is lower, is adopted as a direct write-down (if called for

[16] Devine, *op. cit.*, p. 74.
[17] (1939) Gilman 462.

by the facts of the case) the illustration below is presented.[18] Five alternative sets of facts are assumed in regard to the inventory prices at the end of two successive time periods, as follows:

| | Fiscal Period I | Fiscal Period II |
|---|---|---|
| | Market | Market |
| Case A | $49 | $69 |
| Case B | 49 | 65 |
| Case C | 49 | 74 |
| Case D | 49 | 80 |

In each case the cost of the inventory at the end of time period I was $60, and at the end of time period II, $80. The condensed income statements follow (carried only through the gross margin calculation):

| | Using Cost Figures | Using Lower of Cost or Market | | | |
|---|---|---|---|---|---|
| | | Case A | Case B | Case C | Case D |
| TIME PERIOD I | | | | | |
| Sales | $450 | $450 | $450 | $450 | $450 |
| Cost of Sales: | | | | | |
| First Inventory (at cost) | $ 40 | $ 40 | $ 40 | $ 40 | $ 40 |
| Purchases | 390 | 390 | 390 | 390 | 390 |
| | $430 | $430 | $430 | $430 | $430 |
| Final Inventory | 60 | 49 | 49 | 49 | 49 |
| Cost of Sales | $370 | $381 | $381 | $381 | $381 |
| Gross Margin | $ 80 | $ 69 | $ 69 | $ 69 | $ 69 |
| TIME PERIOD II | | | | | |
| Sales | $510 | $510 | $510 | $510 | $510 |
| Cost of Sales: | | | | | |
| First Inventory (from above) | $ 60 | $ 49 | $ 49 | $ 49 | $ 49 |
| Purchases | 440 | 440 | 440 | 440 | 440 |
| | $500 | $489 | $489 | $489 | $489 |
| Final Inventory | 80 | 69 | 65 | 74 | 80 |
| Cost of Sales | $420 | $420 | $424 | $415 | $409 |
| Gross Margin | $ 90 | $ 90 | $ 86 | $ 95 | $101 |

The conclusions to be drawn from the above illustrations have been well stated as follows:

1. Whenever the initial inventory is at cost and the final inventory at a market evaluation lower than cost, the profit for the year will be reduced by the amount of the difference between the cost and the market value of the final inventory.
2. If the differences between the cost figure and the market value figure for the initial and the final inventories are the same, the profit figure for that year will be the same as if both inventories had been stated at cost.
3. If the difference between the cost figure and market value figure of the final

[18] Illustration taken by permission from Husband, 21 *Accounting Review* 115–118 (,000 omitted).

inventory is greater than the difference between the cost figure and the market value figure of the initial inventory, the profit figure for the year will be reduced by the amount by which the former difference exceeds the latter difference.

4. If the difference between the cost figure and market value figure of the final inventory is less than the difference between the cost and the market value of the initial inventory, the profit for the year will be greater by the amount by which the former is less than the latter.

5. If after market values lower than cost have been used for any period of time a final inventory, consistent with the formula, is stated at cost, all of the previous remaining profit decreases resulting from the use of lower market values in the past will be expressed as an increase in the profit of the year in which the final inventory is so stated.[19]

In summary, therefore, the use of lower of cost or market can be described as conservative at all times only from the viewpoint of the balance sheet; there are occasions, as indicated above, when the profit figure will be larger in certain periods than would be the case if experiential cost were used exclusively. As Husband states the matter:

> . . . it seems clear that the cost-or-market-whichever-is-lower method of inventory evaluation results in profit manipulation rather than in revelation of historical profit. In view of the current emphasis upon the income statement, it would appear to be desirable either to revise the concept of historical accounting or to discard the practice of evaluating the inventory on the cost-or-market-whichever-is-lower basis.[20]

Since the problems of inventories are of major significance in the accounting process, the Committee on Accounting Procedure of the American Institute of Accountants has given the matter major attention in its *Accounting Research Bulletin No. 29*. A large portion of this bulletin is quoted by permission below:

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 the 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*

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 the long-term assets subject to depreciation accounting, or any 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 be classified as part of the inventory. Raw materials and supplies purchased for production may be

[19] Husband, 21 *Accounting Review* 118 (quoted by permission).
[20] Husband, 21 *Accounting Review* 120.

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. By trade practice, operating materials and supplies of oil-producing companies 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*

An inventory has financial significance because revenues may be obtained from its sale, or from the sale of the goods or services in the production of which 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 on 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 in effect a residual amount remaining after the matching of absorbed costs with concurrent revenues. This residual 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 residual amount is determined by the process of pricing the articles comprising 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*

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,[21] and its determination 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, except for the portion of general and administrative expenses that may be clearly related to production, it is generally accepted accounting practice to include such items as period charges and to exclude them from inventory costs

[21] 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. [Footnote in original bulletin]

(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

> 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*

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. Ordinarily, under those circumstances, 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 and general acceptance of several assumptions with respect to the flow of cost factors to provide practical bases for the measurement of periodic income. 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. In other situations a reversed mark-up procedure of inventory pricing, such as the retail inventory method, may be both practical and appropriate. Standard costs, if adjusted at reasonable intervals to reflect current conditions, are acceptable. In some cases, the business operations 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.

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 usefulness 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, change 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*

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 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," [22] 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*

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

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 bulletin and with

[22] The terms "cost or market, whichever is lower" and "lower of cost or market" are used synonymously in general practice and in this bulletin. The committee does not express any preference for either one of the two alternatives. [Footnote in original bulletin]

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 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*

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.

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.

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 comprising 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 of "cost or market" should be applied to each item in the inventory.

When substantial and unusual losses result from the application of the rule of "cost or market, whichever is lower," 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*

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*

It is generally recognized that income accrues only at 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. In cases in which such inventories are stated at sales prices, they should of course be reduced by expenditures to be incurred in disposal, and the fact of the use of such basis should be fully disclosed in the financial statements.

STATEMENT 10

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

*Discussion*

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

The example below illustrates the application of the "useful cost" concept referred to in the bulletin quoted above:

***Example***

The Comwil Company produces a product which it has sold for several years at $2 per unit. During the several years the average net profit per unit has been 18¢. In the seven independent situations below, the last line indicates the inventory price per unit which would be useful in preparing the income sheet and balance sheet if only one unit were on hand at the end of the fiscal period:

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1. Cost per unit . . . . . | $1.44 | $1.52 | $1.54 | $1.68 | $1.70 | $1.70 | $1.36 |
| 2. Replacement cost at inventory date . . . . . | 1.52 | 1.42 | 1.50 | 1.66 | 1.40 | 1.60 | 1.30 |
| 3. Selling price, less estimated cost to complete and sell one unit. . | 1.64 | 1.64 | 1.64 | 1.64 | 1.64 | 1.64 | 1.64 |
| 4. Selling price, less estimated cost to complete and sell and less average profit margin . . . . | 1.46 | 1.46 | 1.46 | 1.46 | 1.46 | 1.46 | 1.46 |
| 5. Inventory price for statement purposes . . . . . | 1.44 | 1.46 | 1.50 | 1.64 | 1.46 | 1.60 | 1.36 |

The Executive Committee of the American Accounting Association has stated its position as follows:

For purposes of determining the expense of a period, it is acceptable to assume a flow of the cost of inventoriable items, for example, "first-in, first-out." The residual cost should be carried forward in the balance sheet for assignment in future periods except when it is evident that the cost of an item of inventory cannot be recovered, whether from damage, deterioration, obsolescence, style change, oversupply, reduction in price levels, or other cause. In such event the inventory item should be stated at the estimated amount of sales proceeds less direct expense of completion and disposal. This concept of residual cost may be applied to inventory items, a group of inventory items, or to total inventory. The method of inventory costing should be consistent from period to period and should conform reasonably with practices established within the industry or trade.[23]

The income statement should reveal the amount of cost assigned to expense by reason of any reduction of an inventory to its recoverable cost.[24]

**Unusual gains and losses and periodic income.** *Introduction and examples.* In the preparation of statements of periodic income, the accountant is frequently confronted with the handling of (and the reporting of) what are called "unusual gains and losses," or "extraordinary items." This particular accounting matter has received a great deal of attention in recent

[23] 23 *Accounting Review* 341–342 (quoted by permission).
[24] *Ibid.*, 343 (quoted by permission).

years even though the problem involved is not new. In essence, the question is concerned with the carrying out of the accounting goal of matching revenues, expired costs, expenses, and losses. In any discussion of this goal, it is inevitable that the treatment of unusual items will come immediately to the forefront since in some respects it constitutes the crux of the matching effort.

The number and variety of unusual items are almost infinite, due to the impossibility of stating definitely just what is to be considered as unusual. Also, in any particular case a charge or credit may be extraordinary based on (1) the amount of money involved, (2) the nature of the item itself, or (3) both. In addition, what may be unusual to one firm might be the normal, expected, and regular occurrence in some other enterprise. All of this makes the problem of classification more difficult and tenuous.

When the accounting for unusual items first began to be considered as being a significant problem, no particular distinction was drawn between those charges and credits which supposedly affect earned surplus, and those that affect the other types or classes of surplus. In recent years, the emphasis on adequate surplus classification has caused a re-examination of the consequences flowing from any suggested treatment of the problem of unusual gains and losses. For instance, the handling of the difference between the purchase and resale price of treasury stock was formerly considered an example of an unusual gain or loss. At the present time, many accountants refer to this difference as a "contributed capital adjustment" (see Chapter 3) rather than a profit or loss item eventually affecting earned surplus. Another instance occurs in connection with the recording of appraisals of fixed assets. Formerly, this was viewed as a possible direct charge or credit to earned surplus, but in more recent times most authorities suggest the use of a separate surplus account, or some type of reserve.

Included in the general problem of treatment of unusual items is the question of disposition of correcting entries made during any fiscal period, which corrections, however, affect the reported profit or loss of a prior period or periods. These errors may arise in arithmetical calculations or they may be caused by mistakes in judgment. For instance, one of the most frequent items requiring attention is the handling of revisions of estimated service life of depreciable fixed assets. Even though this matter is discovered in the current period, it influences the amount of reported income for the prior periods during which the depreciable asset has been on hand. Other types of errors are also discovered subsequent to the period to which they specifically pertain, such as (1) failure to distinguish adequately between repairs and renewals, (2) inventory omissions and clerical errors, and (3) estimate of bad debts.

Some unusual items arise due to what may be called "fortuitous and

unfortuitous" circumstances. All kinds of casualty and accident losses, for example, are included in this group, assuming, of course, that they are not fully covered by insurance. A few types of gains fall in this category. For instance, the insurance proceeds from destruction of enterprise property may exceed the book value of the asset; recoveries of damages in lawsuits and refunds of taxes because of retroactive tax laws are also included in the fortuitous classification.

*Methods of reporting unusual items.* Several alternate methods of reporting unusual items have been suggested from time to time. The more frequently adopted ones are listed and described below:

1. Set up accounts for the items which, in the opinion of the accountant, are influenced by and controlled by the management. Close these accounts to Profit and Loss at the end of the fiscal period and present them on the income statement as usual gains and losses. The fortuitous and unfortuitous items, however, are cleared directly into Earned Surplus and presented on the statement of surplus for the period. At one time this was probably the most widely used method. Its limitations, however, have been noted by many authorities in recent years,[25] the most serious being that (1) the accountant sets himself up as an arbiter as to the "managerial control aspect" of the item involved, (2) certain items are "relegated" to the surplus statement and thus may be overlooked by some readers, and (3) a series of income statements do not reflect all realized revenues, expired costs, expenses, and losses.

2. The second method suggested is to handle all unusual, or in this case what are generally called "nonoperating," items on the surplus statement, thus making the income statement synonymous with what is referred to as a "statement of operations." This method has the support of all the accountants who think of the income statement as a document which is primarily used in connection with the determination of earning power. It has the same limitations, however, as the first technique mentioned above. In addition, the accountant must develop the meaning and connotation to be applied to the word "operations." [26] The latter decision is oftentimes extremely difficult to formulate; the temptation occasionally is to vary the decision as to whether an item is operating or nonoperating on the basis of (1) the number of dollars involved, and (2) whether the item is an addition or a deduction (gain or loss). All these features contribute to a wide variation in actual reporting practice, so much variation, in fact, that many accountants do not view the method as a satisfactory standard for business income reporting.[27]

[25] (1940) Paton-Littleton 17; Kaplan-Reaugh, 14 *Accounting Review* 219–225.
[26] (1940) Paton-Littleton 60.
[27] *Accounting Research Bulletin No. 32.*

3. The third method suggested is to present all operating as well as non-operating items on the current income sheet. This method has the active support of the Executive Committee of the American Accounting Association which in 1948 issued a statement which reads as follows:

> The income of an accounting period should be reported in a statement providing an exhibit of all revenue and expense (including losses) given accounting recognition during that period. This practice assures that the income statements for a period of years will disclose completely the entire income history of that period.
>
> The income statement should be arranged to report consistently and in reasonable detail the particulars of revenue and the expense pertaining to the operations of the current period, measured as accurately as is possible at the time the statement is prepared and also any items of revenue or expense not associated with the operations of the current period. Such arrangement of data in a single statement discloses both the earning performance and the entire income history of the enterprise during a given period.
>
> The income statement should reveal the amount of cost assigned to expense by reason of any reduction of an inventory to its recoverable cost.[28]

The view underlying the above conclusion is that while it may be impossible to assign revenues, expired costs, expenses, and losses to specific time intervals with exactness, it should be possible to derive a cumulative life history of any business enterprise from a review of its past income statements. This is obviously not possible if some items are carried directly into surplus accounts. The income statement is regarded as being primarily an historical document, and if a reader is interested in only a portion of the history for any given time period, he may select the appropriate part for his purposes. Some persons, for instance, are concerned only with the periodic "operating income" of an enterprise while others desire the "whole picture." Again, some readers are interested in long-term trends; they recognize that many items which are unusual and abnormal in respect to a few months or years may lose a large portion of their abnormality if a larger number of fiscal periods are taken into account. This does not mean that only cumulative totals since date of organization are to be regarded as of primary significance. It simply shifts the burden of responsibility to the user of the statement; he must determine for himself what items on the income statement are most pertinent for the purpose he has in mind.[29]

It should be emphasized that under this method of handling unusual items all corrections and adjustments are carried through the current Profit and Loss account even though they pertain to prior years. Items which are closely associated with contributed capital, however, are not to be reported on the income sheet. Some of these latter items are: stock dividends,

[28] 23 *Accounting Review* 343 (quoted by permission).
[29] (1943) May 245.

writing off of stock discount, treasury stock transactions, and transactions involved in recapitalizations and quasi-reorganizations.[30]

This method has considerable use, as indicated by the statistics gathered by the Research Department of the American Institute of Accountants [31] — see below:

1948

37 Profit or loss on disposal of assets (plant, real estate, securities, etc.)

5 Transfer of excess reserves:
- 3 tax provisions (Newport News Shipbuilding & Drydock Co.; National Biscuit Co.; Park & Tilford, Inc.)
- 1 loss on a production (Radio-Keith-Orpheum Corp.)
- 1 contingent liability under government contract (National Company)

8 Prior year adjustments (taxes, depreciation, etc.)

5 Transfer from reserves to offset special costs:
- Estimated loss on shipbuilding contract (Bath Iron Works)
- Higher replacement costs of inventories depleted during the war (U.S. Steel Corp.)
- Cost of standardization of product (Walworth Company)
- Abnormal personnel training expenses, pre-opening expenses of postwar store locations and losses in connection with store closings and rehabilitation. (Rexall Drug, Inc.)
- Past service pension contribution and pensions paid outside Employees' Retirement Plan (The Lambert Company)

9 Employees participation in profits — bonds and profit-sharing plans (Chrysler Corp.)

5 Provision for loss on investments and advances to subsidiaries (American Safety Razor Corp.)

3 Provision to reduce inventories to LIFO basis (Crane Co.)

3 Undistributed net profits of foreign subsidiaries (IBM Corp.)

2 Office and plant movement and rearrangement expenses (United Aircraft Corp.)

3 Proceeds of life insurance policies (May Dept. Stores Co.)

1 Loss on foreign exchange (National Paper & Type Co.)

1 Losses on investments in productions (RKO Corp.)

1 Proportion of undistributed net profits less proportion of net loss affiliates partly owned (United Artists Theatre Circuit, Inc.)

1 Flood loss (Crown Zellerback Corp.)

3 Income from settlement of insurance claims (United Merchants and Manufacturers, Inc.)

1 Loss on operations and liquidation of division (Atlas Powder Co.)

1 Recovery under war subcontract claim (Armstrong Cork Co.)

1 Special provision against decline in exchange rates (Lone Star Cement Corp.)

1 Inactive mill property expenses, net including depreciation (American Writing Paper Company)

[30] May-Chamberlain, 81 *Journal of Accountancy* 366.

[31] Quoted by permission from *Accounting Techniques Used in Published Corporate Annual Reports, 1949*, p. 75. These data exclude charges, appropriations, and credits in connection with contingency, future inventory price decline, and plant replacement reserves, and items not in excess of five per cent of net income.

1 Numerous prior year charges and credits combined as one income credit (Douglas Aircraft Co., Inc.)
1 Provision for profit limitation on government contracts (Lockheed Aircraft Corp.)
1 Write-down of inventories, idle plant, service, experimental and development expenses, etc. (R. G. LeTourneau, Inc.)
1 Provision in respect of foreign exploratory activities of subsidiaries (Standard Oil Company of California)

4. The fourth method suggested is a compromise. It involves a combining of the income statement and earned surplus analysis on a single page in such a way that the reader of the document is not likely to overlook items placed either in the "operating" section or the surplus changes. The advantage of such a presentation lies in the fact that it emphasizes the nonabsolute character of the statement of income.[32] The reader is supposedly placed on guard that the net income for the year is only a tentative figure subject to correction for errors in judgment and other extraordinary items reported on in the surplus statement which is combined with the income statement. While this suggestion has received considerable support in practice, it is not a definitive solution for the problem under discussion. Assuming that the primary goal of the modern accounting process is the determination of the periodic progress of the individual business enterprise, it is inconsistent with the attainment of that goal to prepare reports which do not definitely show the desired information.

5. The fifth method suggested is to report all unusual items on some income statement, but if the unusual charge or credit is to a large extent simply a correction of the income reported in prior years, the accountant prepares a series of amended income statements covering the years which need correction. This may be referred to as "recasting" the income reports after taking advantage of hindsight. If the accountant for a firm discovers in a particular year certain errors in calculations or judgment affecting prior years (for example, in the matter of depreciation allowance) an amended series of income statements would be prepared on which the error would be corrected. Unusual items which arise during a fiscal period and which have little or nothing to do with previous years would be handled on the regular current report. This method was given considerable support by the Executive Committee of the American Accounting Association in 1936;[33] it has also been recommended in recent years to appraise the effects of World War II conditions on the business enterprise.[34] As one authority has expressed it:

[32] *Accounting Research Bulletin No. 8.*
[33] "Tentative Statement of Principles Underlying Corporate Financial Statements," 11 *Accounting Review* 187.
[34] Blough, 80 *Journal of Accountancy* 339.

It is reasonable for managements and accountants to approach the task of preparing statements of recast war-period income in the same spirit as they traditionally approach the preparation of annual statements. It is reasonable to take full advantage of the opportunities afforded by hindsight. It is reasonable to utilize facts which were not available when annual statements were prepared and to revise estimates, judgments, and decisions accordingly.[35]

The revision-of-prior-statements method has been adopted by some accountants in recent years, especially in instances involving renegotiation of war contracts and comparative statements. However, the opinion is widely held that the utility of the income statement is realized in large measure within a short time after its issuance. Moreover, there is oftentimes much doubt as to the number of past years which require amendment, in addition to the fact that people have already acted upon the statements for "good or evil." [36] If this method, for example, had been used by the United States Steel Corporation in 1935 when it wrote down its plant and equipment in an amount of $270 million (because of inadequate depreciation and obsolescence allowances in prior years), it would have been sheer guesswork to estimate the number of years which required correction.[37]

*Summary.* It should not be inferred from the preceding discussion that the problem of handling unusual charges and credits is a new one in accounting circles. It is, indeed, as old as accounting itself, but only in the last decade or two have the implications been sufficiently grasped. The question of appropriate presentation really stems from the difficulty in defining the income or loss for any given period of time. Accountants [38] are more and more coming to the viewpoint that there is no one "net figure" which is suitable for all purposes — it is more pertinent to present the facts and opinions in such a way as to allow the reader of the statement the opportunity of selecting the figures appropriate for his own use. This line of reasoning, however, places more responsibility upon the average reader, and assumes a degree of intelligence and understanding which can only come from long study and experience, but "the day is past when accounting statements must be prepared for the man on the street who reads as he runs the last figures at the bottom of the income statement and no more." [39]

[35] Whitney, 81 *Journal of Accountancy* 378.
[36] Kaplan-Reaugh, 14 *Accounting Review* 222.
[37] Hosmer, 13 *Accounting Review* 49. In this instance the accountants for the corporation debited a previously appropriated earned surplus reserve with the $270 million; the corporation then reported an income for the year of $1,146,708. As a matter of interest, the corporation on December 31, 1948, transferred the $270 million back to the Earned Surplus account with the following explanation: "The economic situation has been so altered by World War II and what has followed that this reserve . . . is no longer needed for the purposes anticipated in 1935."
[38] (1943) May 245.
[39] (1940) Paton-Littleton 101.

Since the handling of unusual charges and credits is of major significance in the accounting process, the Committee on Accounting Procedure of the American Institute of Accountants has studied the problem at length. Its conclusions [40] follow:

1. For a number of years the committee has studied the form and content of financial statements and has considered the means by which they may be made more useful for the purposes they are designed to serve. As a result of this inquiry, and taking cognizance of the expanded public use of corporate financial data, the committee believes it appropriate to issue this statement
   (a) citing briefly the viewpoints with respect to the principal debatable area of the income statement, and
   (b) recommending criteria for use in identifying material extraordinary charges and credits which may or should be excluded from the determination of net income.

2. In dealing with the problem of selecting the most useful form of income statement, the danger of understatement or overstatement of income must be recognized An important objective of income presentation should be the avoidance of any policy of income equalization.

3. The committee directs particular attention to certain facts which serve to emphasize that the word "income" is used to describe a general concept, not a specific and precise thing. Initially, it is important to iterate that the income statement is based on the concept of the "going-concern." It is at best an interim report. Profits are not fundamentally the result of operations during any short period of time. Allocations as between years of both charges and credits affecting the determination of net income are, in part, estimated and conventional and based on assumptions as to future events which may be invalidated by experience. While the items of which this is true are usually few in relation to the total number of transactions, they sometimes are large in relation to the other amounts in the income statement.

4. It must also be recognized that the ultimate distinction between "operating" income and charges and "non-operating" gains and losses, terms having considerable currency in the accounting profession, has not been made. The former are generally defined as recurrent features of business operation, more or less normal and dependable in their incidence from year to year; the latter are generally considered to be irregular and unpredictable, more or less fortuitous and incidental. The committee is also mindful that the term "net income" has been used indiscriminately and often without precise, and most certainly without uniform, definition in the financial press, investment services, annual reports, prospectuses, contracts relating to compensation of management, bond indentures, preferred stock dividend provisions, and in many other places.

5. In the committee's view, the above facts with respect to the income statement and the income which it displays, make it incumbent upon readers of financial statements to exercise great care at all times in drawing conclusions from them.

6. The question of what constitutes the most practically useful concept of income for the year is one on which there is much difference of opinion. On the one hand, net income is defined according to a strict proprietary concept by which it is presumed to be determined by the inclusion of all items affecting the net

[40] Quoted by permission from *Accounting Research Bulletin No. 32* (five reference footnotes omitted).

increase in proprietorship during the period except dividend distributions and capital transactions. The form of presentation which gives effect to this broad concept of net income has sometimes been designated the "all-inclusive" income statement. On the other hand, a different concept places its principal emphasis upon the relationship of items to the operations, and to the year, excluding from the determination of net income any material extraordinary items which are not so related or which, if included, would impair the significance of net income so that misleading inferences might be drawn therefrom. This latter concept would require the income statement to be designed on what might be called a "current operating performance" basis, because its chief purpose is to aid those primarily interested in what a company was able to earn under the operating conditions of the period covered by the statement.

7. Proponents of the "all-inclusive" type of income statement insist that annual income statements taken for the life of an enterprise should, when added together, represent total net income. They emphasize the dangers of possible manipulation of annual earnings if material extraordinary items may be omitted in the determination of income. They also assert that, over a period of years, charges resulting from extraordinary events tend to exceed the credits, and their omission has the effect of indicating a greater earning performance than the corporation actually has exhibited. They insist that an income statement including all income charges or credits arising during the year is simple to prepare, is easy to understand, and is not subject to variations resulting from the different judgments that may be applied in the treatment of individual items. They argue that when judgment is allowed to enter the picture with respect to the inclusion or exclusion of special items, material differences in the treatment of borderline cases will develop and that there is danger that the use of "distortion" as a criterion may be a means of rationalizing the normalization of earnings. With full disclosure of the nature of any special or extraordinary items, this group believes the user of the financial statements can make his own additions or deductions more effectively than can the management or the independent accountant.

8. Those who favor the "all-inclusive" income statement largely presume that those supporting the "current operating performance" concept are mainly concerned with establishing a figure of net income for the year which will carry an implication as to future earning capacity. Having made this presumption, they contend that income statements should not be prepared on the "current operating performance" basis because income statements of the past are of only limited help in the forecasting of the earning power of an enterprise. This group also argues that items reflecting the results of unusual or extraordinary events are part of the earnings history of the corporation, and accordingly should be given weight in any effort to make financial judgments with respect to the company. Since a judgment with respect to the financial affairs of the corporation should involve a study of the results of a period of prior years, rather than of a single year, this group believes that the omission of material extraordinary items from annual income statements is undesirable as it would tend to cause them to be overlooked in such a study.

9. On the other hand, those who advocate the "current operating performance" type of income statement generally do so because they are mindful of the particular business significance which a substantial number of the users of financial reports attach to the income statement. They point out that, while some users of financial reports are able to analyze a statement and eliminate from it those unusual and

extraordinary items that tend to distort it for their purposes, many users are not trained to do so. Furthermore, they contend it is difficult at best to report in any financial statement sufficient data to afford a sound basis upon which the reader who does not have an intimate knowledge of the facts can make a well considered classification. They consider it self-evident that management and the independent auditors are in a stronger position than outsiders to determine whether there are unusual and extraordinary items which, if included in the determination of net income, may give rise to misleading inferences with respect to current operating performance. Relying on the proper exercise of professional judgment, they discount the contention that neither managements nor the independent auditors, due to the absence of objective standards to guide them, have been able to decide consistently which extraordinary charges and credits should be excluded in determining earning performance. They admit it is hazardous to place too great a reliance on the net income as shown in a single annual statement and insist that a realistic presentation of current performance must be taken for what it is and should not be construed as conveying an implication as to future accomplishments. The net income of a single year is only one of scores of factors involved in analyzing the future earnings prospects or potentialities of a business. It is well recognized that future earnings are dependent to a large extent upon such factors as market trends, product developments, political events, labor relationships, and numerous other factors not ascertainable from the financial statements. However, this group insists that the net income for the year should show as clearly as possible what happened in that year under that year's conditions, in order that sound comparisons can be made with prior years and with the performance of other companies.

10. The advocates of this "current operating performance" type of statement join fully with the so-called "all-inclusive" group in asserting that there should be full disclosure of all material charges or credits of an unusual character, including those attributable to a prior year, but they insist that such disclosure should be made in such a manner as not to distort the figure which represents what the company was able to earn from its usual or typical business operations under the conditions existing during the year. They point out that many companies, in order to give more useful information concerning their earning performance, make it a practice to restate the earnings of a number of prior years after adjusting them to reflect the proper allocation of items not related to the years in which they were first reported. They believe that material extraordinary charges or credits may often best be disclosed as direct adjustments of surplus. They point out that a charge or credit in a material amount representing an unusual item not likely to recur, if included in the computation of the company's annual net income, may be so distorting in its results as to lead to unsound judgments with respect to the current earning performance of the company.

11. The committee has previously indicated that, in its opinion, it is plainly desirable that over the years all profits and losses of a business be reflected in net income, but at the same time has recognized that, under appropriate circumstances, it is proper to exclude certain material charges and credits from the determination of the net income of a single year, even though they clearly affect the cumulative total of income for a series of years. In harmony with this view, *it is the opinion of the committee that there should be a general presumption that all items of profit and loss recognized during the period are to be used in determining the figure reported as net income. The only possible exception to this presumption in any case would be with respect to items which in the aggregate are materially significant in relation to*

*the company's net income and are clearly not identifiable with or do not result from the usual or typical business operations of the period.* Thus, only extraordinary items such as the following may be excluded from the determination of net income for the year, and they should be excluded when their inclusion would impair the significance of net income so that misleading inferences might be drawn therefrom:

(a) Material charges or credits (other than ordinary adjustments of a recurring nature) specifically related to operations of prior years, such as the elimination of unused reserves provided in prior years and adjustments of income taxes for prior years;

(b) Material charges or credits resulting from unusual sales of assets not acquired for resale and not of the type in which the company generally deals;

(c) Material losses of a type not usually insured against, such as those resulting from wars, riots, earthquakes, and similar calamities or catastrophes except where such losses are a recurrent hazard of the business;

(d) The write-off of a material amount of intangibles, such as the complete elimination of goodwill or a trademark;

(e) The write-off of material amounts of unamortized bond discount or premium and bond issue expenses at the time of the retirement or refunding of the debt before maturity.

Adjustments resulting from transactions in the company's own capital stock, amounts transferred to and from accounts representing a segregation or appropriation of surplus or general contingency and inventory reserves such as those dealt with in Bulletins 28 and 31, and adjustments made pursuant to a quasi-reorganization, should be excluded from the determination of net income under all circumstances.

12. Consideration has been given to the method of presentation of the extraordinary items that are excluded in the determination of net income under the criteria set forth in the preceding paragraph. Some would carry all such charges and credits directly to the surplus account with complete disclosure as to their nature and amount. Others would report most of those items at the bottom of the income statement immediately following the amount of net income and include them in the determination of the amount carried to surplus. The committee expresses no preference for either of these methods, but is of the opinion that, regardless of the form of presentation, the amount of net income should be clearly and unequivocally designated.

13. In its deliberations concerning the nature and purpose of the income statement, the committee has been mindful of the disposition of even well-informed persons to attach undue importance to a single net income figure and to "earnings per share" shown for a particular year. The committee directs attention to the undesirability in many cases of the dissemination of information in which major prominence is given to a single figure of "net income" or "net income per share." However, if such income data are reported (as in newspapers, investors' services, and annual corporate reports), the committee strongly urges that any determination of "income per share" be related to the amount reported as net income, and that where charges or credits have been excluded from the determination of net income, the corresponding total or per share amount of such charges and credits also be reported separately and simultaneously. In this connection the committee earnestly solicits the cooperation of all organizations, both governmental and private, engaged in the compilation of business earnings statistics from annual reports.

**Unusual items and the Securities and Exchange Commission.** The Securities and Exchange Commission has recently taken a positive stand in regard to the presentation of unusual charges and credits. The Commission has taken the view that full disclosure is the most significant aspect of the problem, as indicated by the excerpts abstracted from *Introduction to Regulation S–X* given below:

The principal new requirement pertains to Profit and Loss or Income Statements and is contained in Rule 5–03 (a) which states:

"All items of profit and loss given recognition in the accounts during the period covered by the profit and loss or income statements shall be included."

The inclusion of this requirement, which states a long established policy of the Commission,* is deemed necessary because of the not always consistent practice followed by some registrants of excluding certain items from the profit and loss or income statements with the result that the amount shown thereon as net income or loss has been susceptible to misinterpretation by investors. Recognizing that there might be exceptional circumstances which would make it appropriate to deviate from this rule, but keeping in mind the Commission's responsibility for prohibiting the dissemination of financial statements which might be misleading to investors, *Rule 5–03. Profit and loss or income statements* was amended to read:

"*Except as otherwise permitted by the Commission,* the profit and loss or income statements filed for persons to whom this article is applicable shall comply with the provisions of this rule." [*Italicized* phrase added in revision.]

The purpose of this revision is to make clear to registrants that they are not forestalled from giving exceptional treatment to exceptional items when both the representatives of the registrant and the Commission are convinced that such treatment is appropriate.

Notwithstanding this provision, representatives of the Executive Committee of the American Institute of Accountants appeared before the Commission and proposed that either Rule 5–03 (a) be eliminated from the regulation or the requirements with respect to the presentation of the final section of profit and loss or income statements be amended to permit, where appropriate, the exclusion of extraordinary items from those making up the caption *Net income or loss.*

To accomplish this, additional items, described in Rules 5–03 (17) and 5–03 (18), were added to those previously set forth in the regulation, and the last three items of the section pertaining to profit and loss or income statements (Rule 5–03) now appear as follows:

"16. Net income or loss.

"17. Special items. — State separately and describe each item of profit and loss given recognition in the accounts, included herein pursuant to Rule

Attention is directed to the 14th Annual Report, Securities and Exchange Commission, 1948, at page 111, wherein the Commission's views advocating the "all-inclusive" as opposed to the "current operating performance" profit and loss or income statement are expressed. This report is obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. (Footnote in original release.)

5–03 (a), and not included in the determination of net income or loss (Item 16).

"18. Net income or loss and special items."

Captions 17 and 18 are to be used in those instances where it is believed that the showing of a single unqualified figure of net income or loss might be misconstrued.

**Statistics on number and amounts of direct charges and credits to surplus.** In order to give the student an indication of the extent to which unusual items (including some transfers between contributed capital and accumulated capital) have been handled directly through various types of surplus, the table on page 445 is presented. It should be noted that dividends are excluded and that the data are for the prewar years of 1935–1939. The details for this period are given (instead of for more recent years) in order to show the frequency and size of unusual items carried through corporate surplus accounts in years of comparative normality. After 1940, of course, the entire business economy was influenced by war factors which placed a different perspective on the problem. Some comments on several of the items follow.

*Write-ups and write-downs of assets.* This matter was discussed in Chapter 11, but the accompanying table shows that revaluations of assets were a common practice in the years 1935 through 1939. Instances of write-downs were nearly three times as frequent as write-ups, and the accounting procedures in asset valuation differed. In some cases, revaluations were charged or credited directly to the assets concerned; in others, the reappraisals were effected through reserve accounts. The following table [41] shows the frequency of asset revaluation and amounts from 1935 to 1939, as to direct write-ups and write-downs against assets:

| | Aggregate Write-ups | | Aggregate Write-downs | |
|---|---|---|---|---|
| Type of Assets | No. of Cases | Amounts (Millions $) | No. of Cases | Amounts (Millions $) |
| Fixed Assets | 200 | 257 | 549 | 855 |
| Intangibles | 27 | 4 | 278 | 453 |
| Security Investments | 161 | 125 | 246 | 802 |
| Totals | 388 | 386 | 1,073 | 2,110 |

In commenting on the above table, the Securities and Exchange Commission made the following statement:

Of the direct net write-downs (write-downs minus write-ups), 674 million dollars (39%) was recorded in 1938 and 392 million dollars (23%) in 1935. Net write-downs in the other three years aggregated somewhat over 200 million dollars annually.

[41] Securities and Exchange Commission, *Statistics of American Listed Corporations*, Part 2, p. 37.

Net direct write-downs from 1935 to 1939 aggregated approximately 545 million dollars each for manufacturing and financial companies, 433 million dollars for electric light and power, 120 million dollars for extractive, and 39 million dollars for merchandising companies. Net direct write-downs during the 5-year period by financial corporations amounted to 36 per cent of their aggregate net worth at book value at the end of 1939, compared with a ratio of net write-downs to net worth of 11 per cent for extractive companies, 7 per cent for electric light and power, 2 per cent for manufacturing and merchandising corporations and 4½ per cent for all 1495 registrants.

In addition, some rather large fixed asset adjustments were made through valuation reserves. From 1935 to 1939, charges to various types of surplus in the reserve accounts aggregated 2,259 million dollars and credits to surplus accounts totaled 1,051 millions.

*Charges and credits resulting from (1) disposal of assets and liabilities, and (2) redemption of stock.* The next group of credits and charges to surplus accounts, as indicated by the table on page 445, consists of charges and credits on disposal of securities, capital or fixed assets, redemption or reacquisition of debt, and redemption or reacquisition of stock.

The discretion of the accountant in the treatment of these items has been previously mentioned, and the table indicates what a sizable difference there would have been in reported income if these charges and credits had been handled in an alternative manner. Charges for losses on securities were somewhat larger in dollars than the credits to surplus accounts, but the frequency of charges and credits was not materially different. The largest amounts charged against surplus accounts for security disposals occurred in 1935 and 1939. The ratio of losses and gains to total revenue, however, is relatively small.

From an analysis of losses on disposal of capital or fixed assets, it is apparent that by far the largest dollar amounts of such losses were charged to surplus accounts. Some idea of the relative frequency of charges and credits for losses and gains on the disposal of these items may be obtained from the table on page 446.

From this table, it is evident that charges and credits for losses and gains on disposal of capital assets were of frequent occurrence in corporate accounting for the years specified, and that the gross amounts were large. From the tabulated figures, the strongest tendency seemed to be to credit Profit and Loss for sales of fixed assets resulting in the larger dollar gains; the frequency is also more pronounced. Secondly, the smaller dollar losses for such sales appeared on the income statement. Thirdly, it is apparent that the registrants were inclined to charge the smaller dollar losses of such sales to Profit and Loss; and finally, the largest dollar losses appeared in surplus. In short, a better income picture was shown by crediting large gains to Profit and Loss. Large losses and small gains frequently went to

**Frequency and Amount of Charges and Credits to All Types of Surplus, Other Than Dividends and Income Taxes, As Shown by Combined Surplus Reconciliation Consolidated from Reports Submitted by 1495 Identical Registered Corporations to Securities and Exchange Commission Under the U. S. Securities Act of 1934** [42]

| Number of Statements 1495 | 1935 | | 1936 | | 1937 | | 1938 | | 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Freq. | $,000 | Freq. | $,000 | Freq. | $,000 | Freq. | $,000 | Freq. | $,000 |
| *Additions to All Types of Surplus Other Than Net Income:* | | | | | | | | | | |
| Write-up of land and plant accounts | 39 | 87,095 | 55 | 38,161 | 38 | 66,290 | 37 | 123,245 | 31 | 2,022 |
| Write-up of intangibles | 10 | 951 | 7 | 1,869 | 3 | 662 | 4 | 29 | 3 | 53 |
| Write-up of security investments | 38 | 13,422 | 38 | 30,544 | 20 | 13,378 | 29 | 45,343 | 36 | 22,527 |
| Profit on: | | | | | | | | | | |
| Disposal of securities | 97 | 5,755 | 92 | 21,786 | 70 | 8,197 | 55 | 4,990 | 66 | 6,943 |
| Disposal of fixed tangible and intangible assets | 26 | 2,013 | 40 | 1,397 | 46 | 8,813 | 28 | 2,229 | 34 | 3,603 |
| Redemption or reacquirement of debt | 83 | 13,126 | 72 | 10,045 | 82 | 4,001 | 87 | 14,139 | 70 | 13,563 |
| Redemption or reacquirement of stock | 179 | 22,691 | 112 | 15,264 | 139 | 21,419 | 176 | 124,744 | 172 | 25,784 |
| Recoveries of bad debts, etc. | 30 | 902 | 22 | 1,038 | 18 | 368 | 11 | 126 | 17 | 2,396 |
| Reduction of value of stock | 60 | 368,619 | 96 | 513,901 | 51 | 183,201 | 25 | 609,341 | 21 | 290,284 |
| Reserve adjustments | 330 | 146,003 | 375 | 171,233 | 306 | 111,803 | 286 | 532,381 | 275 | 95,628 |
| Miscellaneous credits to surplus | 533 | 223,965 | 656 | 326,635 | 608 | 218,699 | 549 | 108,237 | 456 | 104,294 |
| Total Additions to Surplus | ... | 884,542 | ... | 1,131,873 | ... | 576,832 | ... | 1,564,804 | ... | 567,097 |
| *Charges to All Types of Surplus Other Than Income Taxes and Dividends:* | | | | | | | | | | |
| Write-down of land and plant accounts | 136 | 301,478 | 133 | 182,174 | 98 | 79,010 | 88 | 197,132 | 94 | 94,971 |
| Write-down of intangibles | 67 | 139,362 | 62 | 87,169 | 55 | 98,593 | 51 | 54,096 | 43 | 73,535 |
| Write-down of inventories | 15 | 1,358 | 8 | 445 | 12 | 1,219 | 13 | 786 | 5 | 463 |
| Write-down of securities | 42 | 52,235 | 41 | 19,639 | 62 | 46,829 | 41 | 591,563 | 60 | 91,669 |
| Loss on disposal of securities | 53 | 47,430 | 45 | 16,880 | 45 | 10,181 | 40 | 14,561 | 40 | 50,876 |
| Loss on disposal of fixed tangible and intangible assets | 105 | 25,220 | 86 | 18,537 | 79 | 21,294 | 75 | 25,795 | 64 | 28,043 |
| Extraordinary bad debt losses | 20 | 951 | 14 | 2,197 | 7 | 73 | 5 | 8,218 | 5 | 11,828 |
| Unamortized debt discount and expense | 52 | 22,089 | 50 | 28,537 | 33 | 16,012 | 25 | 6,700 | 31 | 13,404 |
| Loss on retirement or reacquisition of debt or stock | 222 | 64,347 | 238 | 84,408 | 211 | 28,054 | 164 | 23,387 | 199 | 25,048 |
| Discount on capital stock | 7 | 3,286 | 12 | 658 | 83 | 2,184 | 7 | 1,086 | 2 | 36 |
| Reserve adjustments | 342 | 473,748 | 310 | 640,846 | 307 | 143,629 | 269 | 720,517 | 266 | 280,220 |
| Miscellaneous debits to surplus | 642 | 244,819 | 708 | 249,134 | 648 | 282,603 | 551 | 162,050 | 513 | 258,973 |
| Total Charges to Surplus | ... | 1,376,323 | ... | 1,330,624 | ... | 729,681 | ... | 1,805,891 | ... | 929,066 |
| Average beginning surplus balance 1935–39 | | $11,393,944,000.00 | | | | | | | | |
| Average 5-year balance for credits | | 925,029,000.00 | | | | | | | | |
| Average 5-year balance for charges | | 1,234,316,000.00 | | | | | | | | |
| Average percentage total credits bears to average surplus balance — 5-year period | | 8% | | | | | | | | |
| Average percentage total charges bears to average surplus balance — 5-year period | | 10% | | | | | | | | |

[42] Excerpts derived from *Ibid.*, p. 65 (Table 1).

**Frequency and Dollar Value of Charges and Credits for Gains and Losses on Sale of Capital Assets, as Shown on Income Statements and Surplus Reconcilements for 1495 Identical Registrants with S.E.C.** [43]

| Frequency and Amount of Profit on Sale of Capital Assets Appearing on Profit and Loss Statement | | | | | Frequency and Amount of Profit on Capital Assets Appearing in Surplus | | | | |
|---|---|---|---|---|---|---|---|---|---|
| *Frequency of Item* | | | | | *Frequency of Item* | | | | |
| 1935 | 1936 | 1937 | 1938 | 1939 | 1935 | 1936 | 1937 | 1938 | 1939 |
| 569 | 596 | 544 | 507 | 504 | 26 | 40 | 46 | 28 | 34 |
| Dollar Amount ($,000 Omitted) | | | | | Dollar Amount ($,000 Omitted) | | | | |
| $36722 | $35659 | $26063 | $17612 | $19373 | $2013 | $1397 | $8813 | $2229 | $3603 |
| Losses Charged to Profit and Loss | | | | | Losses Charged to Surplus | | | | |
| *Frequency of Item* | | | | | *Frequency of Item* | | | | |
| 1935 | 1936 | 1937 | 1938 | 1939 | 1935 | 1936 | 1937 | 1938 | 1939 |
| 357 | 268 | 294 | 220 | 214 | 105 | 86 | 79 | 75 | 64 |
| Dollar Amount ($,000 Omitted) | | | | | Dollar Amount ($,000 Omitted) | | | | |
| $8033 | $8570 | $7444 | $9795 | $28375 | $25220 | $18537 | $21294 | $25795 | $28043 |

surplus. This latter procedure had the tendency to reduce periodic income. The investor, unless he analyzed the surplus accounts, did not get the complete picture of income.

From 1935 through 1939, the 1495 registrants reported through surplus accounts profits aggregating 48 million dollars on disposal of securities compared with aggregate losses of 140 million dollars, or a net loss of 92 million dollars. Sales and retirement of other capital assets resulted in total surplus credits of only 18 million dollars while charges reflecting losses aggregated 119 million dollars, a net surplus charge from such transactions of 101 million dollars.[44]

As to both securities and sale of other capital assets, it is apparent that major losses were charged to surplus accounts.

Instances of reacquisitions and retirement of outstanding funded debt and capital stock were frequent from 1935 to 1939, and charges and credits to surplus accounts from such transactions were substantial in amount. The conclusions reached by the Securities and Exchange Commission in this matter are as follows:

Surplus credits arising from reacquisition of debt securities were reported in 394 instances and amounted to 55 million dollars, while there were stock repurchases and retirements resulting in 778 instances of credits to surplus aggregating 210 million dollars during the 5-year period. Of the total surplus profits from stock

[43] *Ibid.*, p. 65.
[44] *Ibid.*, p. 38.

repurchases and retirements, 125 million dollars or 59 per cent was recorded in 1938. Charges to surplus aggregating 225 million dollars resulted from 1,034 instances of reacquisition and retirement of debt securities and capital stock during 1935–1939; of these charges 64 million dollars was recorded in 1935 and 84 million dollars of unamortized debt discount and expense was written off against surplus during the 5-year period; of this total 22 million was charged off in 1935 and 29 million dollars in 1936.

From 1935 to 1939 there were 253 instances of reduction in par or stated value of capital stock among the 1495 registrants. These resulted in surplus credits aggregating 1,965 million dollars. In many cases, the reductions in value of capital stock were effected in connection with write-downs of assets or write-offs of deficits. Of the total dollar reduction in stock valuations, manufacturing corporations accounted for 52 per cent and electric light and power companies for 25 per cent.[45]

Some data of more recent years are given in the following tables. These do not indicate that there is any conclusive trend developing in regard to the presentation of debatable items.

**Direct Charges and Credits to Earned Surplus**

1934–1941 (Figures based on 500 companies: by Haskins & Sells)

Unusual or Debatable Income or Surplus Items; treatment of 22 different classifications of such items:

| Year | Charges and Credits to Income | Charges and Credits to Earned Surplus | Charges and Credits to Capital Surplus | Total Items for Year |
|---|---|---|---|---|
| 1934 | 159 | 103 | 0 | 262 |
| 1936 | 123 | 141 | 12 | 276 |
| 1941 | 287 | 158 | 25 | 470 |

1939–1944 (Figures based on 162 companies: by Werntz and King)

Number of items contained in 18 listed classifications; treatment as between Income and Earned Surplus.

Totals for six years:

| | |
|---|---|
| Charges and Credits in Income Statement | 1,487 |
| Charges and Credits in Earned Surplus | 1,040 |

Breakdown of Earned Surplus Items:

| Year | Debits | Credits | Total |
|---|---|---|---|
| 1939 | 125 | 83 | 208 |
| 1940 | 119 | 101 | 220 |
| 1941 | 95 | 76 | 171 |
| 1942 | 65 | 79 | 144 |
| 1943 | 77 | 76 | 153 |
| 1944 | 73 | 71 | 144 |
| | 554 | 486 | 1,040 |

[45] *Ibid.*, pp. 38–39.

1946, 1947, 1948 (Figures based on 525 companies: by American Institute of Accountants)

EARNED SURPLUS CHARGES:

| 1948 | 1947 | 1946 | |
|---|---|---|---|
| 40 | 60 | 65 | Prior year adjustments |
| 42 | 60 | 62 | Capital stock transactions |
| 60 | 39 | 27 | To reserves |
| 17 | 31 | 32 | Write-off of intangibles |
| ... | 3 | 8 | Bond discount — write-off |
| 3 | 4 | 7 | Recapitalization expenses |
| 9 | 9 | 6 | Consolidation and merger expense |
| 40 | 40 | 17 | Miscellaneous |
| 7 | 2 | 3 | Unusual losses |
| 218 | 248 | 227 | |

EARNED SURPLUS CREDITS:

| 1948 | 1947 | 1946 | |
|---|---|---|---|
| 95 | 98 | 92 | From reserves |
| 73 | 53 | 69 | Prior year adjustments |
| 16 | 17 | 18 | Unusual gains |
| 17 | 8 | 17 | Consolidation and merger adjustments |
| 5 | 5 | 5 | Adjustment of investments in subsidiaries |
| 5 | 4 | 4 | Capital stock transactions |
| ... | ... | 2 | Negative goodwill |
| 25 | 22 | 19 | Miscellaneous |
| 236 | 207 | 226 | |

**Employee pensions and periodic income.** In the last decade several thousand business firms have adopted pension plans for the benefit of their employees. These plans often include a provision allowing a credit for prior service rendered the firm by the employee. The simplest type of plan is to pay the employee the promised amount when he retires; in this instance, (1) the payments may be charged to the fiscal period in which the outlay occurs, or (2) the expenses of the pension may accrue on an annual basis prior to the time that the payments are to begin. The present authors favor treatment (2).

A more complicated plan involves the "funding" of the annuity pension cost with an independent agency, such as insurance companies, banks, or trustees. In the event that the corporation selects this means of handling the payments to the employees, there may be comparatively large sums paid to the independent outside agency on account of prior service credits of the employees. The way in which these large payments are presented on the financial statements has the possibility of affecting the periodic income in a significant manner. The Committee on Accounting Procedure of the American Institute of Accountants has surveyed this question in *Accounting Research Bulletin No. 36.* Its report, quoted by permission, follows:

1. When costs incurred under pension plans are based in part on services performed prior to the adoption of the plan, the problem arises whether that portion of the costs which are attributable to such services are applicable to the past or to the present and future periods and, accordingly, whether they should be charged to income. This bulletin deals with the accounting treatment of such costs arising out of past services when incurred under pension plans involving payments to outside agencies such as insurance companies and trustees.

2. The committee has undertaken a statement on this subject at this time because of the trend toward expansion of pension plans to cover a wider and much larger group of employees, often at substantially increased costs, and in order to narrow the area of difference in the accounting treatment accorded in actual practice to annuity costs based on past services. . . .

3. Charges with respect to pension costs based on past services have often been made to surplus on the grounds that such payments are indirectly compensation for services and, since the services upon which the payments are computed were performed in the past, the compensation should not be permitted to affect any period or periods other than those in which the services involved were performed. In other cases all annuity costs based on past services have been charged to income in the period of the plan's inauguration as a current cost of originating the plan. In still other cases the position has been taken that a pension plan cannot bring the anticipated benefits in the future unless past as well as future services are given recognition and, accordingly, annuity costs based on past services have been spread over a period of present and future years. The last method is the one permitted under provisions of the Internal Revenue Code [Sec. 23 (p) (1)(A)].

4. The committee believes that, even though the calculation is based on past services, costs of annuities based on such services are generally incurred in contemplation of present and future services, not necessarily of the individual affected but of the organization as a whole and, therefore, should be charged to the present and future periods benefited. This belief is based on an assumption that although the benefits flowing from pension plans are intangible, they are nevertheless real. The element of past services is one of the important considerations of most pension plans and costs incurred on account of such services contribute to the benefits gained by the adoption of a plan. It is usually expected that such benefits will include better employee morale, the removal of superannuated employees from the payroll, and the attraction and retention of more desirable personnel, all of which should result in improved operations.

5. The committee, accordingly, is of the opinion that:

a. Costs of annuities based on past services should be allocated to current and future periods; provided, however, that if they are not sufficiently material in amount to distort the results of operations in a single period, they may be absorbed in the current year.

b. Costs of annuities based on past services should not be charged to surplus.

6. The committee does not intend that its recommendations shall require (a) a change in policy calling for charges to income rather than charges to reserves previously provided, or (b) that any recognition be given in the accounts of current or future periods to pension costs written off prior to the issuance of this bulletin.

*Statistics as to treatment of pension charges and credits on financial statements.* The Research Department of the American Institute of Account-

ants [46] has prepared the following data on the matter of pension charges and credits:

| 1948 | 1947 | |
|---|---|---|
| 28 | 22 | Not separately shown but indicated in the footnotes or president's letter to be included in costs and expenses |
| 9 | 11 | Combined with current pension costs, total thereof shown as a separate amount in the income statement |
| 11 | 8 | Shown separately as an operating expense |
| 1 | 2 | Remaining cost provided for in full by provision in income statement |
| .. | 1 | Shown as last item in income statement after tax provision but before "net profit" |
| 1 | 1 | Included in income statement as pensions are paid |
| 12 | 11 | Charged to pension reserve |
| 2 | 1 | Transfer from contingency reserve to income statement in respect of past service cost or direct charge to contingency reserve |
| 2 | 9 | Charged to earned surplus |
| 1 | .. | Payment charged after "income for year" in combined income and surplus statement, less one-tenth charged to income (West Virginia Pulp and Paper Company) |
| 1 | .. | One-tenth of total cost of past service pensions charged to surplus, remainder set up as a deferred asset (Universal Leaf Tobacco Company, Inc.) |
| 68 | 66 | |

**Retiring and refunding bonds in relation to periodic income.** Many corporations have during the past decade either retired their bonded indebtedness or refunded it under more favorable terms. These transactions have given rise to several perplexing accounting and tax problems, especially in regard to the handling of (1) any unamortized discount or premium on the bond issue retired or refunded, and (2) any premium paid on the call of the old bond issue before its maturity. The problems just noted have been discussed at length by accountants in recent years with the result that the points at issue have been clearly highlighted.

It is beyond the scope of this chapter to treat comprehensively the matters concerned with the decision as to whether refunding should be attempted. This decision involves an intelligent appraisal of the answers to the following questions: [47]

1. How does the cash received from the new issue compare with that required to retire the old?

2. What will be the probable effect, for each year throughout the entire life of the issue, of the refunding on: (a) net income available for dividends, (b) cash available for dividend payments, and (c) probable dividends?

[46] *Accounting Techniques Used in Published Corporate Annual Reports, 1949*, p. 64 (quoted by permission). For further analysis of the pension problem see Kircher, 90 *Journal of Accountancy* 290.

[47] Suggested by Loane-Thomas, 74 *Journal of Accountancy* 231.

3. What will be the probable effect of refunding on the proprietorship of the borrower at maturity of the issue?

4. What will be the probable year-by-year increases in income and other taxes resulting from the refunding?

5. What are the totals of these differences in dividends and in taxes? More important, what are the present values of these future differences?

6. How does the present value of the future differences in dividends plus future difference in proprietorship compare with the investment, if any, that the stockholders are now required to make?

7. How is the probable yield on equity capital affected by the refunding?

It will be noted that several of these questions are based on intangibles and on reasonable guesses. Obviously, therefore, there may be borderline cases where the decision will be in doubt as to whether to refund or retire the bonds. While accountants are often asked to gather essential data for making the determination, the final decision rests with the board of directors and the owners of the enterprise.

*Methods.* Even though the problem of handling the unamortized discount or premium (including call premiums) on the "old" bond issue has been discussed at length in recent years, no clear-cut standards have evolved. Several methods have been suggested from time to time for handling the problem, such as:

1. Charge (or credit) the amount of unamortized discount or premium to a special account which is closed to Profit and Loss at the end of the fiscal period.

2. Charge (or credit) the amount of unamortized discount or premium to Earned Surplus at the time of the refunding or retirement of the "old" issue.

3. Continue to amortize periodically the amount of discount or premium over the remainder of the original life of the retired issue.

4. Continue to amortize periodically the amount of discount or premium over the life of the new issue of bonds which takes the place of the "old."

5. A variation of Method 3 above involves the periodic offsetting of the unamortized discount and redemption premium against the savings in interest resulting from the issuance of the new securities.[48]

The accounting problem involved in this matter is essentially one of periodic income determination. Suppose, for example, a corporation refunds its 5 per cent bonds for a 4 per cent issue, and that $90,000 of unamortized discount pertaining to the 5 per cent issue remains on the books. In addition, there is a call premium of $80,000 on the old bonds. This makes a total of $170,000 in charges which must be disposed of either all at once or gradually, as the decision may be. If this $170,000 is charged

[48] Shanahan, 15 *Certified Public Accountant* 543.

against the revenues of the year in which the refunding takes place, the net income of that year will not be comparable with either the preceding years or the future years. But there is considerable doubt as to whether the net income figure is ever strictly comparable; the immediate write-off to Profit and Loss account treatment does (1) carry out the completed transaction viewpoint and (2) get the item on at least one income statement of the business. The handling of the $170,000 in this way may be compared to the disposition of the undepreciated cost of plant assets when those assets are retired from use in advance of their budgeted life to make way for improved types of equipment. Therefore, the authors believe that, regardless of the method of refinancing, the $170,000 in the example cited above should be closed to Profit and Loss account and reported on the income statement as a specially designated charge.

Method 2 noted above, namely, to charge (or credit) the unamortized discount or premium to Earned Surplus, follows the same closed transaction theory as in Method 1 above, but its adoption means that the unamortized charge will never appear on any periodic income statement.

Method 3 noted above, namely, to continue to amortize the premium or discount (including redemption premiums) over the original life of the "old" issue, has the support of those accountants who believe that the refunding transaction simply carries forward the obligation of the corporation. The reasoning is that the new bonds are substituted for the old; therefore, the entire proposition does not offer sufficient reason not to continue to amortize the debt discount or premium in the identical fashion established when the original issue was first sold. Opposing this view is the fact that most refunding issues carry a sufficiently different interest rate to consider them dissimilar, and also in many cases the new issue of bonds is sold to a different group of investors — the bonds are not simply exchanged for the old issue. In addition, the unamortized discount and call premium are expired costs of terminating a disadvantageous agreement.

Method 4 noted above,[49] namely, to continue to amortize the premium or discount (including redemption premiums) over the life of the new issue, is essentially an extension of the line of reasoning suggested under Method 3 above. It carries, further, the continuing-transaction theory and assumes that the amortization problem is to be indefinitely carried forward. In cases where refunding is resorted to several times before the bonds are finally removed completely from the capital structure of the corporation, this method presents an almost endless process of delaying the final amortization.[50]

*Regulatory influences.* The federal tax procedure requires that bond

[49] This method is supported by Freeman, 60 *Journal of Accountancy* 252
[50] (1944) Sunley-Carter 285.

premium or discount be amortized periodically over the life of the bonds and the elimination of all premium or discount pertaining to retired or refunded bonds on the books at the date of purchase. The difference between the amortized book value and the redemption price of repurchased (or redeemed) bonds is charged against the gross taxable revenue of the year of retirement regardless of whether the bonds are canceled or not.[51] The effect of this requirement on taxable income is shown by the following independent assumptions concerning a 10-year bond, par value $100, repurchased or refunded after four years:

| | | Annual taxable gain or loss* due to amortization | | | | | Taxable redemption | | Taxable total gain loss* |
|---|---|---|---|---|---|---|---|---|---|
| Case | Issue price | 1st Year | 2nd Year | 3rd Year | 4th Year | Book value | Price | Gain; loss* | |
| A | $100 | ... | ... | ... | ... | $100 | $105 | $5* | $5* |
| B | 100 | ... | ... | ... | ... | 100 | 98 | 2 | 2 |
| C | 110 | $1 | $1 | $1 | $1 | 106 | 108 | 2* | 2 |
| D | 110 | 1 | 1 | 1 | 1 | 106 | 105 | 1 | 5 |
| E | 90 | 1* | 1* | 1* | 1* | 94 | 95 | 1* | 5* |
| F | 90 | 1* | 1* | 1* | 1* | 94 | 92 | 2 | 2* |

It should be emphasized that the income tax procedure noted above does not apply when there is an exchange of the new bonds for the old directly with the bondholders.

The procedure indicated in the above table is also followed for income tax purposes if the money used to retire the bonds comes from a sinking fund, ordinary cash receipts from customers, receipts from a new issue of bonds, or receipts from a new issue of capital stock. The only three exceptions recognized by the Treasury Department [52] are as follows:

> In the case of a retirement of an issue of old bonds in part by exchange for new bonds and in part by payment in cash . . . in respect of the portion of the old bonds exchanged for new bonds such items shall be amortized over the life of the new bonds.
>
> In the case of a retirement of old bonds in exchange for new bonds of the same or a greater face value, or by the exchange of new bonds plus a bonus in cash, such items shall be amortized over the life of the new bonds.
>
> . . . in the case of a retirement of old bonds through conversion or exchange for shares of capital stock of the obligor no deduction shall be allowed on account of the unamortized balances of such items in the year the bonds are retired nor shall any amortization allowances be made in respect of such items for subsequent taxable years.

Some regulatory commissions allow the firms under their jurisdiction to accelerate the amortization of ordinary bond discount or premium, thus removing the bond discount or premium from the books prior to the

[51] Regulations 111, Section 29.22 (a)–17.

[52] T.D. 4603, XIV–2 C.B. 507; *Great Western Power Co. v. Commissioner*, 297 U.S. 543.

time the bonds mature.[53] In some instances, the regulatory commissions go so far as to permit the immediate write-off to Earned Surplus of the entire discount at the time the bonds are first issued.

In regard to the attitude of the Securities and Exchange Commission, its chief accountant has stated (*Release No. 10*):

> While it may be permissible to retain on the books and amortize any balance of discount and expense applicable to bonds refunded by other evidences of indebtedness, similar treatment is not ordinarily acceptable, in my [William W. Werntz] opinion, when funds used to retire the existing bonds are derived from the sale of capital stock. In such cases it is my opinion that, as a general rule, sound and generally accepted accounting principles and practice require that the unamortized balance of the debt discount and expense applicable to the retired bonds should be written off, by a charge to earnings or earned surplus, as appropriate, in the accounting period within which the bonds were retired.

As an example of the type of rulings issued by the Securities and Exchange Commission the following excerpt from *Release No. 7348* (Holding Company Act of 1935) may be cited:

> *Accounting Treatment*
>
> The company (Northern States Power Company) proposes to charge to earned surplus (1) the debt discount and expense applicable to the old bonds amounting to $211,792; (2) common stock expense of $1,500 applicable to the issuance of 5,201 additional shares.
>
> Debt discount and expense will be debited with a total of $1,082,698 as a result of the refunding. The latter amount consists of the redemption premium, duplicate interest and redemption expense on the old bonds in the amount of $947,698 and the expense of issuance of the new bonds in the amount of $135,000. Of the $947,698 redemption premiums, the company estimated that $244,000 will be written off by the end of 1947, an amount equivalent to the estimated reduction in federal income taxes by reason of the deductibility from taxable income of refinancing costs applicable to the bonds being refunded. The balance of $703,698 will be amortized by equal monthly charges to income over a period of five years. The $135,000 of expense in issuing the new bonds will be amortized over the life of the new bonds. At the end of the five-year period the annual amortization will amount to approximately $4,500.
>
> We do not consider it necessary to impose any conditions with respect to the accounting treatment suggested by the company. However, our action is not intended to restrict or otherwise affect the jurisdiction of other regulatory agencies which may have occasion to pass upon the accounts of the company.

The Committee on Accounting Procedure of the American Institute of Accountants has issued two bulletins on the subject of the disposition of unamortized bond discount and redemption premiums on bonds retired or refunded. In the first of these bulletins the Committee referred to the immediate write-off treatment as a "permissible method," but favored

[53] Healy, 73 *Journal of Accountancy* 201.

the write-off of the unamortized discount and redemption premium over the original life of the old bonds.[54] Later, the Committee modified its recommendations somewhat [55] and stated:

> Where unamortized discount on bonds refunded is written off in full in the year of refunding, it is sound accounting to show such charges as a deduction in the income statement in the year of refunding in harmony with the treatment required for income tax purposes. Where any write-off is made through surplus it should be limited to the excess of the unamortized discount over the reduction of current taxes to which the refunding gives rise, and there should be shown as a deduction . . . in the income statement for the year of refunding an amount at least equal to such reduction in current taxes.
>
> If the alternative of spreading unamortized discount over a future period is adopted, a charge should be made . . . in the income statement in the year of refunding equal to the reduction in current income tax resulting from the refunding.[56]

*Statistics on the handling of bond discount and redemption premium.* A few years ago some data were gathered bearing on actual practices in the field of bond accounting.[57] A summary of replies to a questionnaire received from 55 utilities, 49 industrials, and 14 railroads follows:

QUESTION I When new bonds are set up, do (or did) you set up both expenses and discounts as deferred charges?

*Answers*

| | Both deferred | Both charged to surplus | Both charged to earnings | Debit divided |
|---|---|---|---|---|
| Industrials | 38 | 9 | 1 | 1 |
| Railroads | 9 | 5 | 0 | 0 |
| Utilities | 54 | 1 | 0 | 0 |

QUESTION III When your old bonds were refunded, how was the unamortized discount handled?

*Answers*

| | Charged to earned surplus | Amortized over life of old bonds | Amortized over life of new bonds | Amortized on another basis |
|---|---|---|---|---|
| Industrials | 36 | 4 | 1 | 0 |
| Railroads | 7 | 0 | 1 | 0 |
| Utilities | 19 | 23 | 4 | 9 |

[54] *Accounting Research Bulletin No. 2.* This bulletin has an extensive memorandum attached to it discussing the background of the matter. For a criticism of the conclusions reached see Kohler, 14 *Accounting Review* 454–456.

[55] *Accounting Research Bulletin No. 18* (quoted by permission).

[56] Three members of the Committee dissented from this recommendation on the ground that the accounting situation involved in refunding is only one of the several instances where acceptable accounting for corporations differs from income tax procedure. These three individuals, therefore, did not think that the bond discount problem should be isolated for special attention, especially since a footnote would constitute adequate disclosure. In the light of the dissenting opinion of these members of the Committee, the reader should observe that in a still later bulletin (No. 23) the Committee recommended an extensive use of the allocation technique referred to in *Bulletin No. 18* above.

[57] Statistics taken by permission from Clendenin, 72 *Journal of Accountancy* 37–44 (question II omitted).

QUESTION IV Was the call premium on refunded bonds handled similarly to the unamortized discount?

*Answers*

| | Yes | Discount amortized over original term; call premium over life of new issue | Charged discount to surplus; amortized call premiums over life of new issue | Miscellaneous |
|---|---|---|---|---|
| Industrials | 44 | 0 | 0 | 3 |
| Railroads | 12 | 0 | 0 | 0 |
| Utilities | 39 | 6 | 3 | 1 |

A more recent study [58] produced the following results:

**Disposition of Certain Items Relating to Bonds Refunded before Maturity by Industrial Corporations**

| | Unamortized Discount and Expense | | Call Premium | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Prematurely written off | 6 | 18 | | |
| Written off to: | | | | |
| Earned surplus | 14 | | 18 | |
| Capital surplus | 1 | | 1 | |
| Income | 11 | | 12 | |
| | 26 | 76 | 31 | 91 |
| Deferred: | | | | |
| Over original life of the old issue | 2 | | 2 | |
| Over life of new issue | | | 1 | |
| | 2 | 6 | 3 | 9 |
| Totals | 34 | 100 | 34 | 100 |

**Disposition of Certain Items Relating to Bonds Refunded before Maturity by Public Utility Corporations**

| | Unamortized Discount and Expense | | Call Premium | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Prematurely written off | 1 | 3 | | |
| Written off to: | | | | |
| Earned surplus | 10 | | 10 | |
| Capital surplus | | | | |
| Income | 1 | | 1 | |
| | 11 | 35 | 11 | 35 |
| Deferred: | | | | |
| Over original life of the old issue | 4 | | 4 | |
| Over life of new issue | 6 | | 7 | |
| Over stated number of years | 9 | | 9 | |
| | 19 | 62 | 20 | 65 |
| Totals | 31 | 100 | 31 | 100 |

[58] Lemke, 22 *Accounting Review* 380 (quoted by permission).

*Handling discount or premium on callable bonds.* Many bond issues have a call feature which is only partially taken advantage of by the issuing corporation each year. The problem of determining the amount of unamortized discount or premium applicable to the part of the issue (if any) retired in any one fiscal period sometimes causes much difficulty. The following problem [59] will illustrate the usual technique employed:

***Illustrative Problem***

On January 1, 1945, the I C Corporation issued $100,000 of callable bonds at 98. The bonds unredeemed at December 31, 1964, are to be paid at par. The bonds are callable at par on any interest date. The following bonds were called:

| | |
|---|---|
| December 31, 1950 | $10,000 |
| December 31, 1952 | 5,000 |
| December 31, 1956 | 30,000 |

Determine the amount of discount unamortized applicable to the bonds retired prior to their due date.

*Solution*

1. Total amount of discount = 2% × $100,000 = $2,000.
2. Annual charge to Bond Discount Amortization account:

   $$\frac{\$2{,}000 \text{ (bond discount)}}{\$100{,}000 \text{ (bonds outstanding)}} \div 20 \text{ years (life of bonds)} = .001 \text{ of the bonds outstanding each year.}$$

3. Multiply the .001 times the remaining life of the bonds retired times the principal amount of bonds called.

   December 31, 1950 call: .001 × 14 (years) × $10,000 = $140
   December 31, 1952 call: .001 × 12 (years) × 5,000 = 60
   December 31, 1956 call: .001 × 8 (years) × 30,000 = 240

4. The $140, $60, and $240 would be charged off respectively in the years of retirement in accord with one of the techniques discussed on pages 455–456 of this chapter.

[59] Baumann, 50 *Journal of Accountancy* 223.

# CHAPTER 14

## Periodicity Factor and Business Income (Concluded)

**Periodic income and capital maintenance.** The term "preservation or maintenance of capital" is one which accountants use from time to time in connection with the problems involved in determining periodic income. The meaning of the expression is not always clear; in fact, the phrase is sometimes meaningless because of the confusion and mystery surrounding the word "capital" (see Chapter 2). Regardless of this, it is often stated that in the accounting for a business the accountant should see that capital is maintained, especially in regard to the following three items: (1) the depreciation charge, (2) deficits and dividend payments, and (3) changing price levels. Before discussing these, it is desirable to list the several variations in the meaning of capital maintenance, as follows: [1]

1. Maintenance of a constant quantity of physical equipment
2. Maintenance of a constant quantity of physical equipment at a given level of technical efficiency
3. Maintenance of a quantity of equipment capable of producing a constant stream of physical output, either at (a) the normal rate of operation, or (b) a capacity rate of operation
4. Maintenance of a collection of assets equal in "value" to the original cost of long-lived equipment
5. Maintenance of a plant capable of earning a constant stream of money income when operating at (a) the normal proportion of capacity, or (b) the actual proportion of capacity
6. Maintenance of equipment expected to earn a constant (over a period of time generally taken long enough to exclude cyclical fluctuations) stream of "real income" after providing for corrections due to price changes
7. Maintenance of a constant proportion of all the assets of the economic system

The several variations in meaning stem to some extent from the physical versus the valuation aspects of capital maintenance. The valuation emphasis is particularly evident in definition 6 above. In the final analysis, however, much of the interest in capital maintenance stems from the desire of individuals and enterprisers to retain their relative purchasing power and psychic income. Due to this fear of "losing out," business managements and accountants may temper their decisions on various matters in order to "preserve" their invested capital.

*Depreciation.* Accountants are agreed at the present time that the service life of many types of assets declines with the passing of time and the use made of the asset. They are also agreed that this decline should be reflected

[1] Bangs, 15 *Accounting Review* 369.

in the financial reports of the enterprise. But after admitting the fact of depreciation, there is not the same general agreement as to the method and base to be used in computing the depreciation for a certain period; there is also some disagreement on the effect and meaning of the depreciation entry. For example, the question may be asked: Does the recording of depreciation preserve or maintain business capital? The answer to this question depends upon whether the revenues of the firm are sufficient to cover all expired costs, expenses, and losses including the depreciation charge. Assuming that the revenues are sufficient, the recording of depreciation reduces the amount of income transferred to earned surplus, which in turn ordinarily reduces the base for dividends (unless liquidation is in process). As a final result there is retained in the business entity a number of dollars of resources (capital) equivalent to the outlay expended for the depreciable asset. Unless specifically earmarked, the resources retained are available for disposition in whatever fashion decided by the management. The working capital may be increased, long-term obligations paid, additional plant and equipment acquired, or a combination of all these applications. The recording of depreciation within itself, however, accomplishes none of these and neither does it automatically maintain "capital." As emphasized by two authorities, "the bearing of depreciation accounting on the maintenance of the integrity of capital and the administration of funds is very roundabout, and it cannot be too strongly emphasized that accruing depreciation is on substantially the same footing as other expense reckonings." [2]

In the past decade considerable attention has been given by accountants to a review of the different methods of applying the cost of fixed asset service against the revenues of the business unit. The system represented by the title "depreciation accounting," which has gained ascendancy in the industrial and mercantile fields of business, should be contrasted with other systems, such as replacement, retirement reserve, and the appraisal view. Space does not allow a comprehensive discussion of these latter systems in this text. It should be observed, however, that their usefulness seems limited to the utility field.

Accounting thinking has been clarified in recent years in regard to depreciation accounting by the attention given to it on the part of the Committee on Terminology of the American Institute of Accountants. This committee has stated that:

> Depreciation accounting is a system of accounting which aims to distribute the cost or other basic value of tangible . . . assets, less salvage (if any), over the estimated useful life of the unit (which may be a group of assets) in a systematic and rational manner. It is a process of allocation, not of valuation. Depreciation for

[2] (1940) Paton-Littleton 89; see also Myer, 19 N.Y.C.P.A. 303.

the year is the portion of the total charge under such a system that is allocated to the year. Although the allocation may properly take into account occurrences during the year, it is not intended to be a measurement of the effect of all such occurrences . . .[3]

This method of accounting may be contrasted with such systems as the replacement, the retirement, the retirement reserve, and the appraisal methods of recognizing the fact that the life of tangible . . . assets is limited.[4]

**Depreciation expense in a period of high asset cost.**[5] In recent years the argument has been advanced by some persons that in a period of high replacement costs it is necessary to charge current period revenue with depreciation based on a figure higher than the enterprise cost, if the reasonable matching of revenues and expenses is to be accomplished. The adoption of this depreciation system does not necessarily mean that the fixed assets themselves are to be appraised upward (see Chapter 11). Rather, the amount of depreciation matched against periodic revenue is increased by a sum sufficient to take care of some of the higher replacement costs which are in evidence at the time. The accounting for depreciation under this view has as one of its fundamental objectives the possibility of providing for the replacing of the asset. It is also to some extent analogous to the last-in, first-out flow of inventory costs in that the newer, higher cost fixed assets are assumed to be the ones used up first in the production of revenue units.

As an alternative to the possibility of basing depreciation expense determination on replacement costs, some accountants favor the immediate charge against periodic revenue of the excess of current construction costs of fixed assets over an estimated normal or reasonable cost of the assets acquired. While this alternative has been adopted by a few firms, the estimates of the "excessive" costs are so difficult to arrive at that it is impossible to do anything other than guess at the amount.

Much has been written on this matter in recent years,[6] but the Committee on Accounting Procedure of the American Institute of Accountants has cogently discussed this matter in *Accounting Research Bulletin No. 33*, a portion of which is quoted by permission below:

1. The American Institute of Accountants committee on accounting procedure has given extensive consideration to the problem of making adequate provision for the replacement of plant facilities in view of recent sharp increases in the

[3] *Accounting Research Bulletin No. 22* (quoted by permission).
[4] *Accounting Research Bulletin No. 20* (quoted by permission).
[5] An excellent summary of this problem is contained in "Effects of Depreciation Policy," National Industrial Conference Board, *Studies in Business Economics No. 22*, (1950).
[6] Spear, 24 *Accounting Review* 369; Moonitz, 23 *Accounting Review* 140; Bailey, 86 *Journal of Accountancy* 364; Jones, 87 *Journal of Accountancy* 9.

price level. The problem requires consideration of charges against current income for depreciation of facilities acquired at lower price levels.

2. The committee recognizes that business management has the responsibility of providing for replacement of plant and machinery. It also recognizes that, in reporting profits today, the cost of material and labor is reflected in terms of "inflated" dollars while the cost of productive facilities in which capital was invested at a lower price level is reflected in terms of dollars whose purchasing power was much greater. There is no doubt that in considering depreciation in connection with product costs, prices, and business policies, management must take into consideration the probability that plant and machinery will have to be replaced at costs much greater than those of the facilities now in use.

3. When there are gross discrepancies between the cost and current values of productive facilities, the committee believes that it is entirely proper for management to make annual appropriations of net income or surplus in contemplation of replacement of such facilities at higher price levels.

4. It has been suggested in some quarters that the problem be met by increasing depreciation charges against current income. The committee does not believe that this is a satisfactory solution at this time. It believes that accounting and financial reporting for general use will best serve their purposes by adhering to the generally accepted concept of depreciation on cost, at least until the dollar is stabilized at some level. An attempt to recognize current prices in providing depreciation, to be consistent, would require the serious step of formally recording appraised current values for all properties, and continuous and consistent depreciation charges based on the new values. Without such formal steps, there would be no objective standard by which to judge the propriety of the amounts of depreciation charges against current income, and the significance of recorded amounts of profit might be seriously impaired.

5. It would not increase the usefulness of reported corporate income figures if some companies charged depreciation on appraised values while others adhered to cost. The committee believes, therefore, that consideration of radical changes in accepted accounting procedure should not be undertaken, at least until a stable price level would make it practicable for business as a whole to make the change at the same time.

6. The committee disapproves immediate write-downs of plant cost by charges against current income in amounts believed to represent excessive or abnormal costs occasioned by current price levels. However, the committee calls attention to the fact that plants expected to have less than normal useful life can properly be depreciated on a systematic basis related to economic usefulness.

*Accelerated depreciation and plant replacement charges on the financial statements.*[7] The great majority of industrial corporations have made no change in their depreciation policies over the past several years.

Changes which have occurred have been limited to about 4 per cent of the number of corporations whose reports have been tabulated. The companies which did make changes were, in general, large corporations.

[7] Taken by permission from a report entitled *Accounting Techniques Used in Published Corporate Annual Reports, 1949*, p. 69.

| 1948 | 1947 | |
|---|---|---|
| 21 | 17 | Charge made prior to net income:<br>16 — accelerated depreciation policy — no exception taken in auditor's report<br>3 — charge stated to be in excess of amount allowable for tax deduction — no exception<br>1 — exception to charge taken by auditor<br>1 — special provision — no exception |
| 14 | 22 | Charge made as an appropriation of net income |
| 11 | 5 | Charge made directly to earned surplus |
| 479 | 481 | No increased charge shown |
| 525 | 525 | |

**"Smoothing" the reported periodic income.** From time to time in business and accounting circles the question of "smoothing" the reported income of the individual firm arises. The concept of smoothing involves the elimination of the sharp peaks and valleys in the reported income of the concern. As is well known, the economy of the country has been subject to periods of prosperity and depression which are reflected to a large or small extent (depending upon conditions in the individual firm) in the income reports prepared periodically for each entity. This results — for many concerns — in widely varying income figures. Business cycles, of course, affect the many segments of the economy in varying ways, depending upon such factors as (1) quantity and dollar amount of inventory maintained; (2) relative importance of fixed and variable costs; and (3) type of product or service handled, i.e., whether a "necessity" or a "luxury" and whether short-lived or long-lived.

The interest in smoothing of the reported income stems partially from the same source as stabilized accounting (see Chapter 16). That is to say, the periods of prosperity and depression are evidenced by rising prices and falling prices. These changes in price levels cause changes in revenues, expired costs, expenses, and losses. Stabilized accounting, therefore, results in a form of smoothing. In addition to stabilized accounting, however, other accounting techniques, procedures, and ideas have been advanced from time to time having as their avowed (or implied) goal the smoothing of the firm's reported income. Some of these are: (1) the base stock method of inventory pricing; (2) the last-in, first-out method of inventory pricing; (3) the standard cost method of inventory pricing; (4) use of secret reserves; (5) use of "operating" reserves which handle fluctuation in expired costs over a period longer than a year; and (6) allowing the periodic depreciation (or depletion) charge to vary proportionally with revenue rather than with the expiration of asset usefulness. Also, it should be remembered that the use of the widely approved accrual method of measuring periodic income (see preceding chapter) has the

tendency to smooth out the reported income — in comparison to what it would be if the cash basis were used. The accrual method, however, does not level out income *per se;* it simply modifies the otherwise reportable income by allocating revenues, expired costs, and losses to the period in which they are realized regardless of the time of cash transfer. Accountants, therefore, are generally agreed that the accrual method is appropriate for most business enterprises.

The attractiveness of the leveling or smoothing idea lies fundamentally in the thought that the income statement of a business unit should indicate to the reader the long-term earning power of the firm. Inherent in the idea also is the notion that the income statement is a report indicating in large measure managerial effectiveness, rather than a report of the over-all results of both managerial effort and cyclical influences. By eliminating as many as possible of the business cycle effects, the income statement would supposedly present only the controllable (within the discretion of the management) items affecting the periodic progress. In regard to inventories, for example, some authorities believe that businesses would be benefited by a scheme which would level out income, or rather a procedure which would smooth out *apparent* ("fool's profits") periodic income.[8] In a period of rising prices, many firms have additional realized income due to their ability to buy merchandise or raw material at a price which gives them a larger gross margin than usual. This is one of the important points involved in the idea of leveling out reported income. The use of some of the techniques mentioned above would supposedly reduce the amount of fluctuation in periodic income, and ostensibly, the smoothing effect would put a damper on the demand for dividends. The lower than otherwise amount of dividends would in turn increase working capital, thus reducing the risk of business failures when prices begin to decline. All of this may be associated with the often expressed adage that the "fat" years must furnish resources sufficient to take care of the "lean" years.

Some authorities have gone on record as favoring certain smoothing techniques. For instance: "If the management wishes to go further and adopt a still more conservative policy in regard to inventory valuation, *calculated to reduce the fluctuations in profits,* that should be regarded as within its province." [9] Again, the last-in, first-out and the standard cost methods of pricing inventory have been adopted by a moderate number of firms. On the opposite side, however, the Committee on Accounting Procedure of the American Institute of Accountants has expressed its opinion as follows: "It is not permissible to create reserves for the purpose of equalizing reported income." [10] The Executive Committee of the Ameri-

[8] See particularly Cotter, A., *Fool's Profits* (New York: Barrons, 1940).
[9] (1938) Sanders-Hatfield-Moore 43 (italics supplied).
[10] *Accounting Research Bulletin No. 13.*

can Accounting Association is just as positive: "Income should not be . . . artificially stabilized by creating arbitrary reserves either by appropriating income or surplus or by overstating expenses in certain periods and subsequently charging to such reserves expenses and losses pertaining to succeeding periods. . . . This comment does not apply to operating reserves created by means of carefully determined charges to current operating expenses." [11] The following quotations from two other authorities provide an excellent summary of the opinions held by many accountants:

> . . . A sharp distinction should be drawn between a reasonable scheme of spreading an annual charge in short-term, interim reports and any device or policy designed to bring about an artificial smoothing of fluctuations resulting from varying business fortunes over a period of years. . . . There are lean years and fat years in business operation and it is a function of accounting to disclose this condition sharply, not to cover it up. . . . The remedy is to supplement the annual statement by cumulative and average reports covering longer periods, rather than to issue "doctored" exhibits. . . . Granting the inherent difficulties involved, it seems necessary to hold that the net income of an enterprise for a period is not made large or small by a method of calculation; its real amount is determined by operating activities and attendant economic conditions. . . . It follows that a manipulation of figures cannot provide a profit or lessen a loss. . . . The accounts should not be artificially modified in order to yield income statements which show a smooth flow of income.[12]

**Relation of imputed costs to periodic income.** On the assumption that realized periodic income is to be measured in accordance with the standards suggested in Chapter 12, imputed costs (such as interest on investment, interdepartmental profits, imputed salaries, and amortized appreciation) should not be allowed to affect income. Imputed costs, which by definition are ascribed vicariously, are not, in the opinion of most accountants, sufficiently objective in nature to be admitted to the accounts unless they are handled in such a way (1) as not to disturb the periodic income which is reported and (2) as not to change the dollar amount placed opposite the inventory figure on the balance sheet. This means that if imputed costs are charged into cost of production or cost of sales, special inventory reserves should be credited for the full amounts of the respective imputed costs for the period, and, at the date of the balance sheet, these special reserves (see Chapter 5) must be debited and a special revenue account credited for the amounts needed to reduce the balances of the reserves to the amounts of imputed cost still remaining in the final inventories.

As a specific example, imputed interest on investment may be selected. This is interest which is ascribed as a cost under the sacrifices-incurred theory of cost; it is not, however, interest paid out to anyone. The supposi-

[11] 16 *Accounting Review* 133–139.
[12] (1940) Paton-Littleton 77–86, *seriatim* (quoted by permission).

tion is that a person who has committed resources to a business unit has made a sacrifice. In order to measure the wisdom of the choice, it is necessary, according to the proponents of the imputed interest theory, to charge against the revenue obtained from the investment a subjectively measured imputed interest cost based generally on an amount which the investor could have obtained from some available alternate choice, such as government bonds. In order to accomplish the imputed interest charge, the following journal entries are prepared:

*Date of Recording Imputed Interest*

| | | |
|---|---|---|
| Burden Incurred (or Factory Overhead) . . . . . | $.... | |
| Reserve for Imputed Interest on Investment . . . . | | $.... |
| To record the budgeted allowance for the period. | | |

*Date of Closing Books*

| | | |
|---|---|---|
| Reserve for Imputed Interest on Investment . . . . | $.... | |
| Imputed Interest on Investment (or Profit and Loss). . | | $.... |
| To reduce the reserve to the amount of interest on investment in final inventories of goods in process and finished goods. | | |

The obvious correctness of the above entries can be seen by assuming a case involving no final or initial inventories. In such a case, the interest debit included in the Burden Incurred account would be cleared through the Goods in Process account and the Finished Goods account into the Cost of Goods Sold account. This eventual charge to Profit and Loss would be offset by the item, Imputed Interest on Investment. The adjusted Reserve for Imputed Interest on Investment account is an imputed valuation reserve and should be deducted from the inventories on the balance sheet. The reserve is classed as a valuation-budgetary reserve on page 164 because the valuation aspects, which appear at the end of the accounting period, are more important than the budgetary aspects, which appear at the start of the accounting period.

**Relation of installment sales of personal property to periodic income.**[13] When the problem of estimating bad debts and collection expenses becomes very difficult, accountants suggest that realized periodic revenue be measured by a proportionate-amount-collected-from-customers procedure called the "installment sales method." This method is an admixture of the cash and accrual bases discussed in the preceding chapter in that the revenues are measured for the most part on a cash basis while a large portion of the expired costs and expenses are measured on an accrual basis. The chief difficulties encountered in installment sales accounting

[13] For comparison of accounting for installment sales under periodic and perpetual inventories see (1933) Taylor-Miller, II, 17–42; (1938) Taylor-Miller 259–282; (1939) Newlove-Smith-White 415–429; (1948) Newlove-Smith-White 556–569.

are (a) the ascertainment of the gross profit (or margin) ratio, (b) the prevention of repossessions and defaults from vitiating the gross profit ratio, and (c) the application of the gross profit ratio to the cash receipts to secure the amount of periodic realized income. As income is assumed to be realized in proportion to collections, no bad debts are recognized although the unrecovered (from customers) cost of goods sold is deducted as a loss on defaults.

The installment sales method naturally does not allow the showing of the same amount of periodic income as when the more usual completed sale method is adopted. The difference between the two presentations may be large or small depending upon such factors as (1) whether the business is developing fast or slowly, (2) type of merchandise handled, (3) length of collection period, and (4) extent of departmentalization of the firm's activities (the more highly departmentalized firm is able to derive a more accurate gross profit ratio). The use of the installment sales method changes the timing of the recognition of income but does not change the total amount of income recognized.

Concerns selling merchandise on both a cash and an installment basis must report the cash sales on the accrual method, but may use the installment method for the installment sales if the cost of goods sold on the two bases can be segregated.[14] If several different lines of merchandise are sold on which the average percentages of profit differ, the gross profit on total sales of each class of merchandise must be computed separately.[15] Firms selling merchandise on the installment method may not allocate the expenses incident to producing the income to the year in which the profits on the sales are realized, but must deduct such expenses on the tax return for the year in which incurred and paid or accrued.[16]

Gross profit as used in the installment sales method is to be determined using the usual accounting standards; freight-in is a cost of goods available for sale.[17] While repossessed merchandise formerly was included in purchases at cost, less proper allowance for damage and use,[18] repossessed merchandise is now priced at its fair market value.[19]

When the installment sales method is used, an account called "Unrealized Gross Profit on Installment Sales" is set up on the books. The debits and credits to this account vary slightly depending upon whether the enterprise handles its merchandise inventory by (1) the perpetual inventory method or (2) the periodic inventory method. (The perpetual

[14] *Mayer & Co.*, 9 B.T.A. 815.
[15] O.D. 25, 1 C.B. 75.
[16] *Franc Furniture Co.*, 1 B.T.A. 420.
[17] *May, Stern & Co., v. Commissioner*, 56 Fed. (2nd) 1034.
[18] *Blum's, Inc.*, 7 B.T.A. 737.
[19] Regulations 111, Section 29.44–1.

method is adopted mostly by the larger firms, and by firms which sell items for a sizable amount per unit, such as pianos.) The credits and debits to this account are indicated below.

*Unrealized Gross Profit on Installment Sales account. Credits.* The unrealized gross profit on installment sales is credited to an account with that title (1) as the sales are made if the perpetual inventory basis is used and (2) when the Installment Sales account is closed at the end of a year if the periodic inventory basis is used. Both the Installment Contracts Receivable and the Unrealized Gross Profit on Installment Sales accounts are controlling accounts while the individual sales contracts serve as subsidiary accounts. As the gross margin ratio varies from year to year and from department to department, the individual installment sales should show the year, the department involved, and the gross margin rate (may be recorded at end of year).

*Debits.* Under both the perpetual inventory and periodic inventory methods the Unrealized Gross Profit on Installment Sales account is debited with the product of the gross profit rate multiplied by the amount of the credits passed to the Contracts Receivable account due (1) to all cash collections and (2) to those defaults occurring in the year subsequent to the year in which the sale was made. Defaults occurring in the year of sale are handled as though they had occurred in the year subsequent to the year of sale under the perpetual inventory basis, but under the periodic inventory basis the effect of the original sale must be taken out of the Installment Sales and the Contracts Receivable accounts.

*Balance.* When the Contracts Receivable account is listed on the balance sheet as an asset, the Unrealized Gross Profit on Installment Sales account may appear on the balance sheet as:

1. Deferred credit to income, or
2. Part of earned surplus, or
3. Part of earned surplus if the costs of collection, etc., are deducted from the asset or if allowance is made for them among the liabilities, or
4. Deducted from Contracts Receivable account.

Method No. 1 is probably the most popular, but it requires a special section on the right-hand side of the balance sheet. Method No. 4 is consistent with the theory of showing as realized income only a percentage of the collections made each period, but it has the tendency to understate the total assets.

Closely related to Method No. 4 above is the practice of omitting the Contracts Receivable and the Unrealized Gross Profit on Installment Sales accounts from the balance sheet, and, in lieu thereof, using either of the folowing presentations on the balance sheet:

1. Set up a Customers' Equity account as a contra to another account, Cost of Delivered Merchandise, on the asset side.

2. List, without deductions, the Cost of Delivered Merchandise account among the assets, and show the Customers' Equity account as a special type of liability.[20]

The second method is to be preferred to the first only when the title to the merchandise does not pass to the buyer until payment has been made in full. Both methods are consistent with the theory underlying installment sales accounting, but they can be justified only on the grounds of conservatism.

***Illustrative Problem No. 1***

A department sells an article for $125 which cost $100; repossessed units are sold immediately to a second-hand dealer for $30. Prepare the journal entries under the perpetual inventory basis and the periodic inventory basis using the following data if all the installment sales contracts have been closed out.

| | 1950 | 1951 |
|---|---|---|
| Sales (units) | 100 | 120 |
| Repossessions (units): | | |
| On 1950 sales | 8 | 2 |
| On 1951 sales | ... | 12 |
| Cash collected: | | |
| On 1950 sales (original): | | |
| Not defaulted | $9,000 | $ 2,250 |
| Defaulted | 500 | 150 |
| On 1951 sales (original): | | |
| Not defaulted | ..... | 13,500 |
| Defaulted | ..... | 850 |

*Solution*

| | Entries Under Inventory Basis | | | |
|---|---|---|---|---|
| | Perpetual * | | Periodic † | |
| 1950 Entries | Debit | Credit | Debit | Credit |
| *For Purchases* | | | | |
| Inventory | $10,000 | ..... | ..... | ..... |
| Purchases | ..... | ..... | $10,000 | ..... |
| Cash | ..... | $10,000 | ..... | $10,000 |

[20] (1938) Paton 606.

* The special accounts, which should be maintained when the installment sales method is used in connection with a perpetual inventory, were outlined in 1920 in O.D. 623, 3 C.B. 105.

† The special accounts, which should be maintained when the installment sales method is used in connection with a periodic inventory, follow the excerpts from *Blum's, Inc.*, 7 B.T.A. 737, non-acq. IX-1 C.B. 62 given below:

In the case of sales made and canceled in the same year on account of default in payments:

Gross sales should be reduced by the total contract price of the canceled sales. All payments made and forfeited by purchasers should be included, in their entirety, in gross income, though not in gross or net sales upon which the percentage of gross profit on all other sales of the year will be computed. In order that the petitioner may have advantage of the deduction, in the year of repossession, of the full amount of the loss sustained, if any, through damage and use of merchandise while in the hands of the purchaser the difference between the value at which such merchandise was included in the opening inventory, or the cost of the merchandise according to whether it was on hand at the beginning of the year or was purchased

| | Entries Under Inventory Basis | | | |
|---|---|---|---|---|
| | Perpetual | | Periodic | |
| | Debit | Credit | Debit | Credit |
| *For Sales* | | | | |
| Contracts Receivable — 1950 | $12,500 | ..... | $12,500 | ..... |
| Inventory | ..... | $10,000 | ..... | ..... |
| Unrealized Gross Profit — 1950 | ..... | 2,500 | ..... | ..... |
| Installment Sales | ..... | ..... | ..... | $12,500 |
| *For Collections* | | | | |
| Cash | 9,500 | ..... | 9,500 | ..... |
| Unrealized Gross Profit — 1950 | 1,900*a* | ..... | ..... | ..... |
| Contracts Receivable — 1950 | ..... | 9,500 | ..... | 9,500 |
| Realized Gross Profit | ..... | 1,900 | ..... | ..... |
| *For Repossessed Goods on 1950 Sales* ‡ (Part A) | | | | |
| Repossessed Merchandise | 240 | ..... | ..... | ..... |
| Unrealized Gross Profit — 1950 | 100*b* | ..... | ..... | ..... |
| Loss on Defaults | 160 | ..... | ..... | ..... |
| Installment Sales | ..... | ..... | 1,000 | ..... |
| Contracts Receivable — 1950 | ..... | 500 | ..... | 500 |
| Receipts from Defaulting Customers | ..... | ..... | ..... | 500 |
| (Part B) | | | | |
| Repossessed Merchandise | ..... | ..... | 240 | ..... |
| Loss on Defaults | ..... | ..... | 560 | ..... |
| Purchases | ..... | ..... | ..... | 800 |
| *For Sales of Repossessed Goods* | | | | |
| Cash | 240 | ..... | 240 | ..... |
| Sales — Repossessed Merchandise | ..... | 240 | ..... | 240 |

*a*. .20 × $9,500 = $1,900.

*b*. .20 × $500 = $100.

during the year, and its value when repossessed, should be deducted from the cost of goods sold and taken as a separate loss deduction from gross income.

In the case of sales canceled, on account of default in payments, in a year subsequent to the year or years in which made:

No deduction in the gross sales of the year should be made. All payments made and forfeited by the purchaser, in the year in which the sale is canceled, should be included, in their entirety, in gross income for that year, though not in gross or net sales upon which the percentage of profit on sales for the year will be computed. Payments made in prior years should not be taken into account in computing gross income for the year in which the sale was canceled. The repossessed merchandise should be included in purchases at cost, less proper allowance for damage and use, if any, or at cost, less that part thereof previously recovered through payments made by the purchasers, in prior years, and not returned as income, whichever is lower. The difference, if any, between the cost, less allowance for damage and use, and cost, less any part thereof previously recovered, should be taken as a loss deduction from gross income of the year of repossession.

The cost of repossessed merchandise should be determined by applying to the contract price (selling price to defaulted purchaser) that percentage rate which is complementary to the percentage rate of profit for the year in which the sale was made.

‡ Under a periodic inventory, entries for defaults in the same year that the sales are made should be divided into two parts because Part B usually cannot be made until after the inventory is taken and the cost of goods sold determined.

| | Entries Under Inventory Basis | | | |
|---|---|---|---|---|
| | Perpetual | | Periodic | |
| | Debit | Credit | Debit | Credit |
| *For Closing Entries for 1950* | | | | |
| Realized Gross Profit | $ 1,900 | | | |
| Receipts from Defaulting Customers | | | $ 500 | |
| Sales — Repossessed Merchandise | 240 | | 240 | |
| Installment Sales | | | 11,500 | |
| Purchases | | | | $ 9,200 |
| Loss on Defaults | $ 160 | | | 560 |
| Unrealized Gross Profit — 1950 | | | | 500*c* |
| Repossessed Merchandise | | 240 | | 240 |
| Profit and Loss — 1950 | | 1,740 | | 1,740 |

*c.* Computed as follows:

| | | |
|---|---|---|
| Total sales — 1950 | | $12,500 |
| Collections | $9,500 | |
| Defaulting Customers | 500 | 10,000 |
| Uncollected Contracts — 1950 | | $ 2,500 |
| 20% thereof | | $ 500 |

1951 Entries

*For Purchases*

| | | | | |
|---|---|---|---|---|
| Inventory | 12,000 | | | |
| Purchases | | | 12,000 | |
| Cash | | 12,000 | | 12,000 |

*For Sales*

| | | | | |
|---|---|---|---|---|
| Contracts Receivable — 1951 | 15,000 | | 15,000 | |
| Inventory | | 12,000 | | |
| Unrealized Gross Profit — 1951 | | 3,000 | | |
| Installment Sales | | | | 15,000 |

*For Collections*

| | | | | |
|---|---|---|---|---|
| Cash | 16,750 | | 16,750 | |
| Unrealized Gross Profit — 1950 | 480*d* | | | |
| Unrealized Gross Profit — 1951 | 2,870*e* | | | |
| Contracts Receivable — 1950 | | 2,400 | | 2,400 |
| Contracts Receivable — 1951 | | 14,350 | | 14,350 |
| Realized Gross Profit | | 3,350 | | |

*d.* .20 × $2,400 = $480.
*e.* .20 × $14,350 = $2,870.

*For Repossessed Goods on 1950 Sales* §

| | | | | |
|---|---|---|---|---|
| Repossessed Merchandise | 60 | | 60 | |
| Unrealized Gross Profit — 1950 | 20*g* | | 20 | |
| Loss on Defaults | 20 | | 20 | |
| Contracts Receivable — 1950 | | 100*f* | | 100 |

*f.* $12,500 − $9,500 − $500 − $2,400 = $100.
*g.* .20 × $100 = $20.

§ It should be noted that the entries for defaults in a year subsequent to that of sale are identical under perpetual and periodic inventories.

| | Entries Under Inventory Basis | | | |
|---|---|---|---|---|
| | Perpetual | | Periodic | |
| | Debit | Credit | Debit | Credit |
| *For Repossessed Goods on 1951 Sales* ‡ | | | | |
| (Part A) | | | | |
| Repossessed Merchandise | $ 360 | ..... | ..... | ..... |
| Unrealized Gross Profit — 1951 | 130*i* | ..... | ..... | ..... |
| Loss on Defaults | 160 | ..... | ..... | ..... |
| Installment Sales | ..... | ..... | $ 1,500 | ..... |
| Contracts Receivable — 1951 | ..... | $ 650*h* | ..... | $ 650 |
| Receipts from Defaulting Customers | ..... | ..... | ..... | 850 |
| *h*. (12 × $125) − $850 = $650. | | | | |
| *i*. .20 × $650 = $130. | | | | |
| (Part B) | | | | |
| Repossessed Merchandise | ..... | ..... | 360 | ..... |
| Loss on Defaults | ..... | ..... | 840 | ..... |
| Purchases | ..... | ..... | ..... | 1,200 |
| *For Sales of Repossessed Goods* | | | | |
| Cash | 420 | ..... | 420 | ..... |
| Sales — Repossessed Merchandise | ..... | 420 | ..... | 420 |
| *For Closing Entries for 1951* | | | | |
| Realized Gross Profit | 3,350 | ..... | ..... | ..... |
| Receipts from Defaulting Customers | ..... | ..... | 850 | ..... |
| Unrealized Gross Profit — 1950 | ..... | ..... | 480 | ..... |
| Sales — Repossessed Merchandise | 420 | ..... | 420 | ..... |
| Installment Sales | ..... | ..... | 13,500 | ..... |
| Repossessed Merchandise | ..... | 420 | ..... | 420 |
| Purchases | ..... | ..... | ..... | 10,800 |
| Loss on Defaults | ..... | 180 | ..... | 860 |
| Profit and Loss — 1951 | ..... | 3,170 | ..... | 3,170 |

Under both inventory bases, the post-closing trial balances at the end of the calendar years are as follows (reflecting only the entries given above):

| | December 31, 1950 | | December 31, 1951 | |
|---|---|---|---|---|
| Cash | ..... | $ 260 | $ 4,910 | ..... |
| Contracts Receivable — 1950 | $ 2,500 | ..... | ..... | ..... |
| Unrealized Gross Profit — 1950 | ..... | 500 | ..... | ..... |
| Profit and Loss — 1950 | ..... | 1,740 | ..... | $ 1,740 |
| Profit and Loss — 1951 | ..... | ..... | ..... | 3,170 |
| | $ 2,500 | $ 2,500 | $ 4,910 | $ 4,910 |

### *Illustrative Problem No. 2*

(To show use of Working Trial Balance method)

From the following trial balance of the Household Furniture Corporation and accompanying data, prepare the balance sheet at December 31, 1951, and the income statement for the year ended that date:

| | | |
|---|---|---|
| Cash | $ 83,000.00 | ..... |
| Installment Accounts Receivable | 1,078,000.00 | ..... |
| Sundry Advances | 7,000.00 | ..... |
| Reserve for Doubtful Accounts, January 1, 1951 | ..... | $ 27,000.00 |
| Reserve for Collection Expenses, January 1, 1951 | ..... | 14,000.00 |
| Merchandise Inventory, December 31, 1951 | 160,000.00 | ..... |
| Furniture and Fixtures | 15,000.00 | ..... |
| Delivery Equipment | 12,000.00 | ..... |
| Reserve for Depreciation, December 31, 1951 | ..... | 6,300.00 |
| Improvements to Leaseholds | 8,600.00 | ..... |
| Reserve for Amortization, December 31, 1951 | ..... | 3,100.00 |
| Prepaid Expenses | 4,900.00 | ..... |
| Accounts Payable | ..... | 92,400.00 |
| Reserve for Contingencies | ..... | 75,000.00 |
| Capital Stock (8,000 shares of $100 par each) | ..... | 800,000.00 |
| Earned Surplus | ..... | 358,318.75 |
| Sales — Installment | ..... | 1,068,750.00 |
| Sales — Cash | ..... | 56,250.00 |
| Cost of Sales — Installment | 567,506.25 | ..... |
| Cost of Sales — Cash | 37,662.50 | ..... |
| Selling and General Expenses | 367,450.00 | ..... |
| Dividends Paid | 160,000.00 | ..... |
| | $2,501,118.75 | $2,501,118.75 |

The corporation sells household goods on the installment plan. Payments are deferred over periods ranging from 12 to 18 months. No carrying charges are made, the selling price being the full amount payable by the customer.

The entire profit is taken up as income of the year in which the sales are made, and federal income taxes are provided on that basis. The federal taxes are paid, however, on the installment basis (see Note 2 below), and the unpaid balance, representing taxes on the unrealized profit in the installment accounts receivable, is carried as a reserve for contingencies.

At the end of each year the installment accounts are evaluated so that the Reserve for Doubtful Accounts (losses on defaults) may be adjusted to correspond with this appraisal. The Reserve for Collection Expenses is also at that time adjusted to an amount that equals 1½ per cent of the installment accounts receivable after deducting the Reserve for Doubtful Accounts. (Both of these adjustments are made even though the Reserve for Collection Expenses is not recognized for federal income tax purposes.)

Upon examination of the books the following additional information has become available:

Installment accounts receivable amounting to $18,500 are considered worthless and should be written off. The management further estimates that a reserve of $28,500 will be adequate to provide for additional losses on account of doubtful customers' balances. The auditor, however, believes that this reserve may not be adequate, but he cannot convince the management.

It was also found that the Reserve for Collection Expenses at the beginning of the year had not been correctly computed.

During the year $5,100 had been written off for losses on repossessed goods, as follows:

| | |
|---|---|
| On sales in 1948 | $3,500 |
| On sales in 1949 | 1,500 |
| On sales in 1950 | 800 |
| On sales in 1951 | 600 |
| | $6,400 |
| Value of repossessed goods | 1,300 |
| Written off, as above | $5,100 |

The $18,500 of worthless accounts represents sales made in the following years:

| | |
|---|---|
| 1948 | $12,000 |
| 1949 | 3,000 |
| 1950 | 2,000 |
| 1951 | 1,500 |
| | $18,500 |

The collections during the year applied to installment sales as follows:

| | |
|---|---|
| 1948 | $ 3,600 |
| 1949 | 58,000 |
| 1950 | 210,000 |
| 1951 | 820,000 |
| | $1,091,600 |

The previous years' percentages of gross profit were:

| | |
|---|---|
| 1948 | 49% |
| 1949 | 48% |
| 1950 | 46.5% |

NOTES

1. Assume a combined normal and surtax of 38 per cent.
2. According to Section 44 of the Internal Revenue Code: "... a person who regularly sells ... on the installment plan may return as income therefrom in any taxable year that proportion of the installment payments actually received in that year which the gross profit realized or to be realized when payment is completed, bears to the total contract price."

(American Institute, adapted)

*Solution*

(1)

| | | |
|---|---|---|
| Reserve for Doubtful Accounts | $ 18,500.00 | |
| Installment Accounts Receivable | | $ 18,500.00 |
| To charge off the worthless installment accounts. | | |

(2)

| | | |
|---|---|---|
| Reserve for Doubtful Accounts | 5,100.00 | |
| Selling and General Expenses | | 5,100.00 |
| To write off loss on repossessions against the Reserve for Doubtful Accounts. | | |

(3)

| | | |
|---|---|---|
| Bad Debts Expense | $ 25,100.00 | |
| Reserve for Doubtful Accounts | | $ 25,100.00 |
| To increase the Reserve for Doubtful Accounts to $28,500, the figure determined by the management. | | |

(4)

| | | |
|---|---|---|
| Earned Surplus | 160,000.00 | |
| Dividends Paid | | 160,000.00 |
| To close dividends paid to Earned Surplus. | | |

(5)

| | | |
|---|---|---|
| Collection Expense Applicable to 1950 | 2,203.75 | |
| Reserve for Collection Expenses | | 2,203.75 |

To correct the Reserve for Collection Expenses account as of January 1, 1951, as follows:

| | | |
|---|---|---|
| Installment accounts receivable at December 31, 1951, per the books | | $1,078,000.00 |
| Add: | | |
| Accounts written off in 1951 | $ 6,400.00 | |
| Collections during 1951 | 1,091,600.00 | 1,098,000.00 |
| Total | | $2,176,000.00 |
| Deduct: | | |
| Installment sales during 1951 | $1,068,750.00 | |
| Reserve for Doubtful Accounts, 1/1/51 | 27,000.00 | 1,095,750.00 |
| Net amount of installment accounts receivable, 1/1/51 | | $1,080,250.00 |
| 1½% thereof | | $ 16,203.75 |
| Reserve, per books, 1/1/51 | | 14,000.00 |
| Additional amount required | | $ 2,203.75 |

(6)

| | | |
|---|---|---|
| Reserve for Collection Expenses | 738.75 | |
| Selling and General Expenses | | 738.75 |

To adjust the Reserve for Collection Expenses to 1½ per cent of the installment accounts receivable, after deducting the Reserve for Doubtful Accounts.

| | | |
|---|---|---|
| Installment accounts receivable, per books | | $1,078,000.00 |
| Deduct: | | |
| Worthless accounts written off | $ 18,500.00 | |
| Reserve for Doubtful Accounts | 28,500.00 | 47,000.00 |
| Remainder | | $1,031,000.00 |
| Balance of reserve after entry 5 above | | $ 16,203.75 |
| 1½% of $1,031,000.00 | | 15,465.00 |
| Reduction in reserve required | | $ 738.75 |

(7)

| | | |
|---|---|---|
| Reserve for Contingencies | $59,475.09 | |
| Federal Income Tax Payable 1951 | | $9,475.09 |

To reduce the Reserve for Contingencies by the amount of the federal income tax actually payable for the year ended December 31, 1951, calculated as follows:

Gross profit on installments collected during 1951:

| Collections | | Gross Profit | | |
|---|---|---|---|---|
| Year | Amount | Rate | Amount | |
| 1948 | $ 3,600 | 49.0% | $ 1,764 | |
| 1949 | 58,000 | 48.0% | 27,840 | |
| 1950 | 210,000 | 46.5% | 97,650 | |
| 1951 | 820,000 | 46.9% | 384,580 | |
| | $1,091,600 | | $511,834 | $511,834.00 |

Gross profit on cash sales for 1951:

| | | |
|---|---|---|
| Sales | $ 56,250.00 | |
| Less: Cost of Sales | 37,662.50 | 18,587.50 |
| Total gross profit | | $530,421.50 |
| Deduct: Selling and general expenses, per books | $367,450.00 | |
| Less: Loss on repossessions written off | 5,100.00 | |
| | $362,350.00 | |

Loss on repossessed goods:

| Repossessions | | Cost | | | |
|---|---|---|---|---|---|
| Year | Amount | Rate | Amount | | |
| 1948 | $3,500 | 51.0% | $1,785.00 | | |
| 1949 | 1,500 | 52.0% | 780.00 | | |
| 1950 | 800 | 53.5% | 428.00 | | |
| 1951 | 600 | 53.1% | 318.60 | | |
| | $6,400 | | $3,311.60 | | |
| Less: Value of repossessed goods | | | 1,300.00 | 2,011.60 | |

Loss on uncollectible amounts:

| | | Cost | | | |
|---|---|---|---|---|---|
| Year | Amount | Rate | Amount | | |
| 1948 | $12,000 | 51.0% | $6,120.00 | | |
| 1949 | 3,000 | 52.0% | 1,560.00 | | |
| 1950 | 2,000 | 53.5% | 1,070.00 | | |
| 1951 | 1,500 | 53.1% | 796.50 | | |
| | $18,500 | | $9,546.50 | 9,546.50 | |
| Total deductions | | | | | 373,908.10 |
| Net taxable income on the installment basis | | | | | $156,513.40 |

Amount of tax: 38% × $156,513.40 = $59,475.09

It is assumed that the company is entitled to a tax deduction in 1951 in respect of the loss on the $18,500 of accounts written off at December 31, 1951, and that no present recovery value exists on these accounts in the form of merchandise which can be repossessed. If such deduction is not allowable, taxable income is $166,059.90 ($156,513.40 plus $9,546.50), and the tax would be larger.

No income tax deduction for addition to Reserve for Collection Expenses is allowable to companies using the installment sales method of determining taxable income.

(8)

| | | |
|---|---|---|
| Federal Income Tax | $ 49,748.18 | |
| Reserve for Contingencies | | $ 49,748.18 |

To set up charge for federal income tax on 1951 income statement, based on book profit, as adjusted, before federal tax:

38 per cent of adjusted book profit, $130,916.25, equals $49,748.18. For determination of adjusted book profit see Note 1 attached to the income statement.

(9)

| | | |
|---|---|---|
| Reserve for Contingencies | 65,273.09 | |
| Federal Income Tax Payable (upon collection of outstanding installment accounts — estimated) | | 65,273.09 |

To transfer balance of Reserve for Contingencies to an account with a more descriptive title.

| | |
|---|---|
| Balance of Reserve, 1/1/51 | $ 75,000.00 |
| Less: Entry (7) above. | 59,475.09 |
| | $ 15,524.91 |
| Add: Entry (8) above. | 49,748.18 |
| Balance, 12/31/51, adjusted | $ 65,273.09 |

The figure of $65,273.09 is purely an estimate, since credits to Income Tax Payable account are based on rates current in year of sale, while actual amount of taxes payable each year in this case is based on income tax rates current in year installments are collected.

## HOUSEHOLD FURNISHING CORPORATION
### Balance Sheet
December 31, 1951

ASSETS

| | | | | |
|---|---|---|---|---|
| Current Assets: | | | | |
| Cash | | | $ 83,000.00 | |
| Installment Accounts Receivable | $1,059,500.00 | | | |
| Less: Reserve for Doubtful Accounts (Note 1) | $28,500.00 | | | |
| Reserve for Collection Expense. | 15,465.00 | 43,965.00 | 1,015,535.00 | |
| Merchandise Inventory | | | 160,000.00 | $1,258,535.00 |
| Prepaid Expenses: | | | | |
| Prepaid Expenses | | | $ 4,900.00 | |
| Sundry Advances | | | 7,000.00 | 11,900.00 |
| Fixed Assets: | | | | |
| Furniture and Fixtures | | | $ 15,000.00 | |
| Delivery Equipment | | | 12,000.00 | |
| Total | | | $ 27,000.00 | |
| Less: Reserve for Depreciation | | | 6,300.00 | |
| | | | $ 20,700.00 | |
| Improvements to Leaseholds | $8,600.00 | | | |
| Less: Reserve for Amortization | 3,100.00 | | 5,500.00 | 26,200.00 |
| | | | | $1,296,635.00 |

## HOUSEHOLD FURNISHING CORPORATION
### Working Papers — December 31, 1951

| | Trial Balance | | Adjustments | | Profit and Loss | | Balance Sheet | |
|---|---|---|---|---|---|---|---|---|
| | Debit | Credit | Debit | Credit | Debit | Credit | Debit | Credit |
| Cash | $ 83,000.00 | | | | | | $ 83,000.00 | |
| Installment Accounts Receivable | 1,078,000.00 | | | (1)$ 18,500.00 | | | 1,059,500.00 | |
| Sundry Advances | 7,000.00 | | | | | | 7,000.00 | |
| Reserve for Doubtful Accounts | | $ 27,000.00 | (1)$ 18,500.00 | (3) 25,100.00 | | | | $ 28,500.00 |
| | | | (2) 5,100.00 | | | | | |
| Reserve for Collection Expenses | | 14,000.00 | (6) 738.75 | (5) 2,203.75 | | | | 15,465.00 |
| Merchandise Inventory | 160,000.00 | | | | | | 160,000.00 | |
| Furniture & Fixtures | 15,000.00 | | | | | | 15,000.00 | |
| Delivery Equipment | 12,000.00 | | | | | | 12,000.00 | |
| Reserve for Depreciation | | 6,300.00 | | | | | | 6,300.00 |
| Improvements to Leaseholds | 8,600.00 | | | | | | 8,600.00 | |
| Reserve for Amortization | | 3,100.00 | | | | | | 3,100.00 |
| Prepaid Expenses | 4,900.00 | | | | | | 4,900.00 | |
| Accounts Payable | | 92,400.00 | | | | | | 92,400.00 |
| Reserve for Contingencies | | 75,000.00 | (7) 59,475.09 | (8) 49,748.18 | | | | |
| | | | (9) 65,273.09 | | | | | |
| Capital Stock | | 800,000.00 | | | | | | 800,000.00 |
| Earned Surplus | | 358,318.75 | (4) 160,000.00 | | | | | 198,318.75 |
| Sales — Installment | | 1,068,750.00 | | | | $1,068,750.00 | | |
| Sales — Cash | | 56,250.00 | | | | 56,250.00 | | |
| Cost of Sales — Installment | 567,506.25 | | | | $ 567,506.25 | | | |
| Cost of Sales — Cash | 37,662.50 | | | | 37,662.50 | | | |
| Selling and General Expense | 367,450.00 | | | (2) 5,100.00 | 361,611.25 | | | |
| | | | | (6) 738.75 | | | | |
| Dividends Paid | 160,000.00 | | | (4) 160,000.00 | | | | |
| | $2,501,118.75 | $2,501,118.75 | | | | | | |
| Bad Debts Expense | | | (3) 25,100.00 | | 25,100.00 | | | |
| Collection Expense Applicable to 1950 | | | (5) 2,203.75 | | 2,203.75 | | | |
| Federal Income Tax | | | (8) 49,748.18 | | 49,748.18 | | | |
| Federal Income Tax Payable upon Collection of Installment Accounts | | | | (9) 65,273.09 | | | | 65,273.09 |
| Federal Income Tax Payable for 1951 | | | | (7) 59,475.09 | | | | 59,475.09 |
| Net Income for Year after Federal Tax | | | | | 81,168.07 | | | 81,168.07 |
| | | | $386,138.86 | $386,138.86 | $1,125,000.00 | $1,125,000.00 | $1,350,000.00 | $1,350,000.00 |

| | | | |
|---|---|---|---|
| LIABILITIES AND PROPRIETORSHIP | | | |
| Current Liabilities: | | | |
| Accounts Payable | | $ 92,400.00 | |
| Federal Income Tax Payable, 1951 (Note 2) | | 59,475.09 | $ 151,875.09 |
| Other Liabilities: | | | |
| Federal Income Tax Payable upon Collection of Installment Accounts — (Estimated) | | | 65,273.09 |
| Total Liabilities | | | $ 217,148.18 |
| Capital Stock, 8,000 Shares, $100 par | | $ 800,000.00 | |
| Earned Surplus, January 1, 1951 | $358,318.75 | | |
| Net Income for Year 1951 | 81,168.07 | | |
| | $439,486.82 | | |
| Less: Dividend Paid | 160,000.00 | 279,486.82 | 1,079,486.82 |
| | | | $1,296,635.00 |

NOTE 1. In the opinion of the auditor, the Reserve for Doubtful Accounts is inadequate.
NOTE 2. This amount was determined by using the installment sales method of reporting taxable income.

**HOUSEHOLD FURNISHING CORPORATION**
**Statement of Income**
Year 1951

| | Installment Sales | Cash Sales | Total |
|---|---|---|---|
| Sales | $1,068,750.00 | $ 56,250.00 | $1,125,000.00 |
| Less: Cost of Sales | 567,506.25 | 37,662.50 | 605,168.75 |
| Gross Margin | $ 501,243.75 | $ 18,587.50 | $ 519,831.25 |
| Selling and General Expenses | | $361,611.25 | |
| Bad Debts Expense | | 25,100.00 | |
| Federal Income Tax (Note 1) | | 49,748.18 | 436,459.43 |
| | | | $ 83,371.82 |
| Less: Collection Expense Applicable to 1950 | | | 2,203.75 |
| Net Income for Year | | | $ 81,168.07 |

NOTE 1. The federal income tax shown on this statement was determined on the basis of ordinary accrual accounting. Actually, the corporation files its tax return on the installment sales basis. The tax given on the above statement is based on the adjusted taxable income of $130,916.25, which is the gross margin of $519,831.25, less the selling and general expenses, $361,611.25, bad debts expense, $25,100.00, and collection expense, $2,203.75.

**Installment method for real estate sales.** *Definition of terms.* Income Tax Regulation 111, Section 29.44–2, states that the installment method of accounting for sales of real estate contemplates for each sale at least one payment during the first taxable year and at least one payment in the ensuing year, that the method may be used only if the "initial payments" are 30 per cent or less of the "selling price," that the amount of each payment to be reported as income is the ratio of the "gross profit" realized or to be realized to the "total contract price," and that commissions and other selling expenses paid or incurred by the vendor are not to be deducted or taken into account in determining the amount of the "initial payments," the "total contract price," or the "selling price." The words within the quotation marks have legal interpretations which must be adhered to; these definitions are as follows:

1. "Selling price" includes all the payments to be made by the vendee to both the vendor and to the holders of assumed mortgages.

2. "Total contract price" includes all the payments the vendor will have received when the vendee has paid for the property.

3. "Total gross profit" is the excess of the "selling price" over the tax basis of the real estate plus any commissions or expenses caused by the sale.

4. "Initial payments" includes the cash and fair market value of property (other than obligations of the vendee) received during the taxable year in which the sale was made and any excess of a mortgage placed by the vendor after acquisition of the real estate (mortgage assumed by vendee) over the tax basis of the real estate. The sum of the "initial payments" and future payment to the vendor equals the "total contract price."

These general definitions are subject to many refinements; the most important of these refinements are included in the solution to the following problem: [21]

*Illustrative Problem No. 3*

On January 1, 1949, X bought a lot for $7,000 and a store building (remaining expected life 10 years) for $18,000; he paid $4,000 in cash and gave a first mortgage (6 per cent) for $9,000 and a second mortgage (8 per cent) for $12,000 — each mortgage payable in five equal annual installments. Because of a change in the location of a highway, the real estate increased markedly in value, and on March 1, 1951, X placed a third mortgage for $30,000, interest at 4 per cent payable annually. On December 31, 1949 and 1950, X paid the interest and installments due on the first and second mortgages.

On June 1, 1951, X sold the real estate to Y in exchange for $3,665 in cash, $3,000 worth of General Electric bonds, $2,000 in notes of R originally payable to Y and endorsed to X by Y (worth face), $2,500 in notes signed by X and given to S in non-real estate transaction (payment by Y endorsed thereon by S), and a fourth mortgage calling for four semiannual payments of $7,000 (interest on outstanding balance 2 per cent semiannually). On date of sale, Y placed government bonds worth $70,000 in escrow to insure the payments of the mortgages issued or assumed by him; Y assumed the first and third mortgages with accrued interest thereon but not the second mortgage. On June 1, 1951, X, who is a grocer, paid a sales commission of $5,000.

On December 1, 1951, Y paid the first installment on the fourth mortgage, and X sold the installment of the fourth mortgage due June 1, 1953, for $6,900 (considered worth face value originally) and paid the second mortgage at 110 and accrued interest.

Compute X's taxable income if his books are kept on a calendar year basis and he desires to use the installment sales method for the real estate sale and the accrual method for ordinary transactions (ignore X's interest income on General Electric bonds and on R's notes).

[21] See Fleischman, 16 N.Y.C.P.A. 316–319; Meyer, 17 N.Y.C.P.A. 306–312.

*Solution*

| 1949 | | 1950 | |
|---|---|---|---|
| Ordinary business deduction for depreciation: $\frac{1}{10} \times \$18,000 = \$1,800$ | | Ordinary business deduction for depreciation: $\frac{1}{8} \times \$16,200 = \$1,800$ | |
| Ordinary business deduction for interest: | | Ordinary business deduction for interest: | |
| On 1st mtge. (.06 × $9,000) | $ 540 | On 1st mtge. (.06 × $7,200) | $ 432 |
| On 2d mtge. (.08 × $12,000) | 960 | On 2d mtge. (.08 × $9,600) | 768 |
| Total | $1,500 | Total | $1,200 |

1951

| | | | |
|---|---|---|---|
| "Selling Price" of Real Estate: | | | |
| Payments to vendor at date of sale: | | | |
| Cash | | | $ 3,665 |
| Market value of property (other than obligations of vendee) transferred to vendor: | | | |
| General Electric bonds | | | 3,000 |
| Y's notes receivable endorsed over to X | | | 2,000 |
| X's notes payable (non-real estate) paid by Y | | | 2,500 |
| Mortgages to be paid by vendee: | | | |
| Placed by vendor at acquisition of real estate ($9,000 − $1,800 − $1,800) | | | 5,400 |
| Placed by vendor after acquisition of real estate | | | 30,000 |
| Placed by vendee payable in future | | | 28,000 |
| Accrued interest on first mortgage assumed by Y in 1950 and paid in 1950 | | | 135 |
| Accrued interest on third mortgage assumed by Y in 1950 and paid in 1951 | | | 300 |
| Total | | | $75,000 |
| "Total Contract Price" of Real Estate: | | | |
| Payments received prior to sale: | | | |
| Mortgage placed by vendor after acquisition assumed by vendee | | $30,000 | |
| Tax basis of property to vendor: | | | |
| Cash paid at acquisition | $ 4,000 | | |
| First purchase money mortgage | 9,000 | | |
| Second purchase money mortgage | 12,000 | $25,000 | |
| Less depreciation taken on building ($2\frac{1}{2}$ years) | 4,350 | 20,650 | $ 9,350 |
| Payments received at date of sale: | | | |
| Cash | | $ 3,665 | |
| Market value of property (other than obligations of vendee) transferred to vendor: | | | |
| General Electric bonds | | 3,000 | |
| Y's notes receivable endorsed to X | | 2,000 | |
| X's notes payable (non-real estate) paid by Y | | 2,500 | 11,165 |
| Payments to be received after sale but in same taxable year: | | | |
| First installment on fourth mortgage | | $ 7,000 | |
| Accrued interest on first mortgage assumed and paid by Y in 1950 | | 135 | 7,135 |
| Payments receivable after taxable year in which sale occurred: | | | |
| Second, third, and fourth installments on fourth mortgage | | $21,000 | |
| Accrued interest on third mortgage assumed by Y in 1950 and paid in 1951 | | 300 | 21,300 |
| Total | | | $48,950 |

| | | | |
|---|---|---|---|
| "Gross Profit" on Real Estate: | | | |
| "Selling price" (as above) | | | $75,000 |
| Tax basis of property to vendor (as above) | | | 20,650 |
| Difference | | | $54,350 |
| Commissions and expenses on sale since vendor is not real estate dealer [22] | | | 5,000 |
| Gross profit on sale | | | $49,350 |
| "Initial Payments" on Real Estate: | | | |
| Mortgage placed by vendor after acquisition assumed by vendee | | $30,000 | |
| Tax basis of property to vendor | | 20,650 | $ 9,350 |
| Payments received at date of sale: | | | |
| Cash | | $ 3,665 | |
| Market value of property (other than obligations of vendee) [23] transferred to vendor: | | | |
| General Electric bonds | | 3,000 | |
| Y's notes receivable endorsed to X [24] | | 2,000 | |
| X's notes payable (non-real estate) paid by Y [25] | | 2,500 | 11,165 |
| Payments received after sale but in same taxable year: [26] | | | |
| First installment on fourth mortgage [27] | | $ 7,000 | |
| Accrued interest on first mortgage assumed and paid in 1950 by Y [28] | | 135 | 7,135 |
| Total | | | $27,650 |
| Taxable income from sale of real estate: | | | |
| From "initial payments": [29] | | | |
| 27,650/48,950 × $49,350 | | | $27,875.95 |
| From sale of fourth installment of fourth mortgage (see discussion in next section): | | | |
| Proceeds from sale of installment | $6,900.00 | | |
| Face value of installment | $7,000.00 | | |
| Reportable income if satisfied in full: | | | |
| 7,000/48,950 × $49,350 | 7,057.20 | | |
| Excess of reportable income if satisfied in full over face value | | 57.20 | 6,957.20 |
| Total | | | $34,833.15 |

[22] Such outlays are ordinary business expense to real estate dealer. I.T. 2305, V-2 C.B. 108.

[23] Property placed in escrow to insure future payments is not "initial payments." *Gibbs & Hudson Inc.*, 35 B.T.A. 205.

[24] Such notes are not "obligations of vendee." *J. W. Elmore*, 15 B.T.A. 1210.

[25] Payment by purchase of an obligation of vendor is "initial payments." *Wagegro Corporation*, 38 B.T.A. 1225.

[26] Amount received by vendor from sale of vendee's obligations to third party is excluded from "initial payments." G.C.M. 12987, XIII-1 C.B. 206. If vendor pledges obligations of vendee for a loan, the proceeds of loan do not affect "initial payments." *Elmer v. Comm.*, 65 Fed. (2nd) 568.

[27] "Initial payments" provisions apply to taxable year in which sale occurs. *M. L. Elken*, 7 B.T.A. 1160.

[28] Taxes and interest assumed by vendee as part of consideration of transfer are not "initial payments" unless paid in taxable year of sale. *Katherine H. Watson*, 20 B.T.A. 270.

[29] Subject to capital gain provisions. I.T. 1737, II-2 C.B. 44.

| | |
|---|---|
| Taxable income from interest on fourth mortgage: | |
| Received December 1, 1951 ($28,000 × .04 × ½) | $ 560.00 |
| Accrued December 1 to 31 on second and third installments: | |
| $14,000 × .04 × 1/12 | 46.67 |
| Total | $ 606.67 |
| Ordinary business deduction for depreciation: | |
| ⅛ × $14,400 × 5/12 | $ 750.00 |
| Ordinary business deduction for interest: | |
| Second mortgage interest: .08 × $7,200 × 1½ | $ 528.00 |
| Second mortgage redemption premium | 720.00 |
| First mortgage assumed by Y | 135.00 |
| Third mortgage assumed by Y | 300.00 |
| Total | $ 1,683.00 |

1952

| | |
|---|---|
| Taxable income from sale of real estate: | |
| From second and third installments on fourth mortgage: | |
| 14,000/48,950 × $49,350 | $14,114.40 |
| From accrued interest on third mortgage assumed by Y: | |
| 300/48,950 × $49,350 | 302.45 |
| Total | $14,416.85 |
| Taxable income from interest on fourth mortgage: | |
| Second installment: $7,000 × .04 × ½ | $ 140.00 |
| Third installment: $7,000 × .04 | 280.00 |
| | $ 420.00 |
| Less accrued in 1951 | 46.67 |
| Net | $ 373.33 |

*Disposition of installment obligations.* Article 44, Internal Revenue Code, reads as follows:

If an installment obligation is satisfied at other than its face value or distributed, transmitted, sold, or otherwise disposed of, gain or loss shall result to the extent of the difference of the basis of the obligation and (1) in the case of satisfaction at other than face value or a sale or exchange — the amount realized, or (2) in case of a distribution, transmission, or disposition otherwise than by sale or exchange — the fair market value of the obligation at the time of such distribution, transmission, or disposition. Any gain or loss so resulting shall be considered as resulting from the sale or exchange of the property in respect of which the installment obligation was received. The basis of the obligation shall be the excess of the face value of the obligation over an amount equal to the income which would be returnable were the obligation satisfied in full.

The above applies with equal force whether the installment obligations are an outgrowth of a transaction involving personal property or real property.

The two illustrations given in Section 29.44–5, Regulations 111 (changed in form slightly) are:

A corporation sold property costing $10,000 for $5,000 cash and $15,000 vendee's notes payable in subsequent years. A taxable income of $2,500 (i.e., .50 × $5,000) was reported for the year of sale. If, before the vendee made any further payments, the company disposed of its notes, what was the taxable income for the second year if:

*Example 1.* The notes were sold for $13,000 cash.

| | | |
|---|---|---|
| Proceeds of sale of notes | | $13,000 |
| Face value of notes | $15,000 | |
| Amount of income returnable were the notes satisfied in full, 50 per cent of $15,000 | 7,500 | |
| Excess of face value of notes over amount of income returnable were the notes satisfied in full | | 7,500 |
| Taxable income to be reported in second year | | $ 5,500 |

(Note that $5,500 + $2,500 = $8,000, and the total income is [($5,000 + $13,000) − $10,000] or $8,000.)

*Example 2.* The notes were distributed as a dividend; the fair market value at date of distribution was $14,000.

| | |
|---|---|
| Fair market value of the notes | $14,000 |
| Excess of face value of notes over amount of income returnable were the notes satisfied in full — computed as in Example 1 | 7,500 |
| Taxable income to be reported in second year | $ 6,500 |

*Repossessed real estate.* The income tax regulations have been changed until under Regulations 111 repossessions under the installment plan are treated the same whether the property is personal property (Section 29.44–1) or real property (Section 29.44–3).

### *Illustrative Problem No. 4*

On September 1, 1950, X sold a lot for $8,750 to Y. X had held the lot for several years; its tax basis was $5,000. On September 1, 1950, Y paid a down payment of $2,250, assumed a first mortgage of $2,500, and gave a second mortgage of $4,000. After paying two of the semiannual second mortgage notes of $400 each, Y defaulted (insolvent). X bid in the property for $4,750 (first mortgage assumed, $2,500; cancellation of Y's second mortgage notes, $2,250). If the fair market value of the lot upon repossession is $5,000, compute X's recognized gain by years.

### *Solution*

| | |
|---|---|
| Profit ($3,750) is 60 per cent of total contract price ($6,250) | |
| Recognized gain on 1950 collection: | |
| $2,250 × .60 | $1,350 |
| Recognized gain on 1951 collection: | |
| $800 × .60 | 480 |
| Recognized gain in 1950 and 1951 | $1,830 |

| | | | | | |
|---|---|---|---|---|---|
| Recognized 1950–1951 gain (detailed on page 483) | | | | | $1,830 |
| Recognized gain in 1952: | | | | | |
| Original mortgage indebtedness | | | $4,000 | | |
| Amount paid | | | 800 | | |
| Mortgage indebtedness remaining unpaid | | | $3,200 | | |
| Bid price (excluding assumed mortgage) | | | 2,250 | | |
| Worthless obligations retained | | | $ 950 | | |
| Less: Profit not realized (60 per cent) | | | 570 | | |
| Amount of bad debt | | | | $ 380 | |
| Fair market value at repossession | | | $5,000 | | |
| First mortgage assumed | | $2,500 | | | |
| Obligations of Y applied to bid price: | | | | | |
| Face value | $2,250 | | | | |
| Less: Profit not realized (60 per cent) | 1,350 | 900 | 3,400 | | |
| Gain | | | | 1,600 | 1,220 |
| Total | | | | | $3,050 |
| Proof: | | | | | |
| Received — cash ($2,250 + $800) | | | | $3,050 | |
| Repossessed property | | | | 5,000 | $8,050 |
| Original basis of property | | | | | 5,000 |
| Gain | | | | | $3,050 |

The above schedule for computing the recognized gain in the year of repossession is recommended because it distinguishes between the bad debt loss (ordinary business deduction) and the repossession gain (long-term capital gain).

*Deferred payment of real estate not on installment plan. All payments collected.* When all payments are collected on real estate sales not reported on the installment plan, the obligations of the purchaser received by the vendor are considered as the equivalent of cash to the amount of their fair market value.[30] If the payments are collected, it does not make any difference whether the vendor transferred title at date of sale or at date of final payment.

***Illustrative Problem No. 5***

A building (life 50 years) costing $7,000 and land costing $3,000 on January 1, 1946, were sold January 1, 1950, the purchaser paying $5,000 in cash, assuming a mortgage on the property of $3,000, and giving a serial note for $1,400 a year for 5 years. How should the income be reported if the fair market value of the serial notes was 75 per cent of face?

*Solution*

| | | | |
|---|---|---|---|
| Selling price | | | $15,000 |
| Residual cost (January 1, 1950): | | | |
| Land | | $3,000 | |
| Building | $7,000 | | |
| Less 4 years' depreciation | 560 | 6,440 | 9,440 |
| Total profit on transaction | | | $ 5,560 |

[30] *Regulations 111*, Section 29.44–4.

| | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 | Total |
|---|---|---|---|---|---|---|---|
| Proceeds realized: | | | | | | | |
| Cash | $ 5,000 | $1,400 | $1,400 | $1,400 | $1,400 | $1,400 | $12,000 |
| Mortgage (par value). | 3,000 | ..... | ..... | ..... | ..... | ..... | 3,000 |
| Serial notes (market value) | 5,250 | ..... | ..... | ..... | ..... | ..... | 5,250 |
| | $13,250 | $1,400 | $1,400 | $1,400 | $1,400 | $1,400 | $20,250 |
| Costs: | | | | | | | |
| Residual | 9,440 | ..... | ..... | ..... | ..... | ..... | $ 9,440 |
| ⅕ of serial notes (value) | ..... | 1,050 | 1,050 | 1,050 | 1,050 | 1,050 | 5,250 |
| | | | | | | | $14,690 |
| Recognized gain | $ 3,810 | $ 350 | $ 350 | $ 350 | $ 350 | $ 350 | $ 5,560 |

If the purchaser's obligations have no fair market value, the vendor is entitled to secure the return of his capital before reporting any income. [31]

***Illustrative Problem No. 6***

Compute the reportable income in Illustrative Problem No. 5 if the serial notes had no fair market value.

*Solution*

| | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 | Total |
|---|---|---|---|---|---|---|---|
| Proceeds realized: | | | | | | | |
| Cash | $5,000 | $1,400 | $1,400 | $1,400 | $1,400 | $1,400 | $12,000 |
| Mortgage (par value) | 3,000 | ..... | ..... | ..... | ..... | ..... | 3,000 |
| | $8,000 | $1,400 | $1,400 | $1,400 | $1,400 | $1,400 | $15,000 |
| Capital recovered | 8,000 | 1,400 | 40 | ..... | ..... | ..... | 9,440 |
| Recognized gain | ..... | ..... | $1,360 | $1,400 | $1,400 | $1,400 | $ 5,560 |

*Repossession by voluntary conveyance when title has been transferred.* The ordinary taxable income or bad debt deduction caused by repossession is computed by considering the receipt of the property to the extent of its fair market value as payment of the unpaid balance of the purchaser's obligations.

***Illustrative Problem No. 7***

If the purchaser in Illustrative Problem No. 5 paid the assumed mortgage and January 1, 1951, installment on the serial notes, but then became insolvent; and on January 1, 1952, the property, fair market value $5,000, was recovered by voluntary conveyance, determine the effect of the repossession upon the vendor's 1952 taxable income and the future tax basis of the property.

*Solution*

| | |
|---|---|
| Serial notes remaining unpaid | $ 5,600 |
| Less: Discount on serial notes (25 per cent) | 1,400 |
| Basis of unpaid serial notes | $ 4,200 |
| Fair market value of property at time of repossession (also new basis) | 5,000 |
| Recognized gain | $ 800 |

[31] *Burnet v. Logan*, 283 U.S. 404.

| | | |
|---|---|---|
| Proof: | | |
| Received cash in 1950 | $5,000 | |
| Mortgage assumed and paid in 1950 | 3,000 | |
| Received cash in 1951 | 1,400 | |
| Fair market value of property voluntarily conveyed in 1952 | 5,000 | $14,400 |
| Tax basis of property | | 9,440 |
| Total income | | $ 4,960 |
| Gain recognized: | | |
| In 1950 (see Illustrative Problem No. 5) | | $ 3,810 |
| In 1951 (see Illustrative Problem No. 5) | | 350 |
| In 1952 (see above) | | 800 |
| Total | | $ 4,960 |

*Repossession by foreclosure when title has been transferred.* When the mortgagee forecloses and bids in the property, he may have a capital gain or loss in addition to a bad debt deduction.

***Illustrative Problem No. 8***

Same as Illustrative Problem No. 7 if the mortgagee had foreclosed and bid the property in for $4,000 instead of accepting a voluntary surrender of the property.

*Solution*

| | |
|---|---|
| Basis for unpaid serial notes | $4,200 |
| Bid price for property | 4,000 |
| Amount of bad debt deduction | $ 200 |
| Fair market value of property (also new basis) | $5,000 |
| Serial notes applied to bid price | 4,000 |
| Recognized gain | $1,000 |

The recognized gain ($1,000) minus the bad debt deduction ($200) is the $800 gain in Illustrative Problem No. 7, but the $1,000 is only 50 per cent taxable.

*Repossession when title has been retained.* The recognized gain or loss is the difference between the payments received and retained and the sum of the income previously reported and the depreciation on the property while in the hands of the purchaser.

***Illustrative Problem No. 9***

Same as Illustrative Problem No. 7 if the vendor had retained title.

*Solution*

| | | |
|---|---|---|
| Payments retained by vendor upon repossession (down payment, $5,000; mortgage assumed and paid by purchaser, $3,000; 1951 serial note, $1,400) | | $9,400 |
| Less: Income previously reported ($3,810 in 1950 and $350 in 1951) | $4,160 | |
| Depreciation for 1950 and 1951 ($2 \times \frac{1}{50} \times \$7,000$) | 280 | 4,440 |
| Recognized gain in 1952 | | $4,960 |

| | |
|---|---|
| Basis of property upon repossession: | |
| Original basis | $9,440 |
| Less: 1950 and 1951 depreciation | 280 |
| Revised basis | $9,160 |

The above may be reconciled with the data for Illustrative Problems No. 7 and No. 8, if it is assumed that the property was sold on January 1, 1952, for $5,000 cash.

| | No. 7 and No. 8 | No. 9 |
|---|---|---|
| Gain recognized: | | |
| In 1950 | $3,810 | $3,810 |
| In 1951 | 350 | 350 |
| In 1952 upon repossession | 800 | 4,960 |
| In 1952 upon resale (loss*) | nil | 4,160* |
| Total | $4,960 | $4,960 |

**Costing for real estate subdivisions.** The proper matching of the revenues and costs of real estate subdivisions is required by both ordinary accounting standards and income tax regulations. Taxes and interest actually paid may be either capitalized or taken as deductions immediately for income tax purposes;[32] according to ordinary accounting standards such charges should be capitalized except when there is a long period of holding and little or no enhancement in value of the property.[33] Estimated future development expenditures must be assigned (in the costs to be apportioned) in an equitable manner to the individual lots under both ordinary accounting standards[34] and income tax regulations.[35] The exact method of cost allocation is not prescribed although the relative tentative sales value method may be used under ordinary accounting standards[36] and income tax rulings.[37] The sale of each lot must be treated as a separate transaction and gain or loss computed accordingly.[38] If the estimated future expenditures should subsequently be ascertained to be incorrect, the annual profits should be recomputed; amended returns should be filed for an adjustment of the tax for the years affected.[39] If the error in estimating future development costs is not too great, the requirements of precise theory and the letter of the income tax provisions are sometimes ignored and the difference is closed to income for the year in which the error is ascertained.[40]

[32] Regulations 111, Section 29.24–5.
[33] (1943) Paton 593–594.
[34] (1943) Paton 135.
[35] O.D. 567, 3 C.B. 108; *Milton A. Mackay*, 11 B.T.A. 569.
[36] (1943) Paton 595; (1941) Paton 366.
[37] *Prentice-Hall Federal Tax Service, 1950*, Section 10,171–A. Other methods which may be used are: (1) foot frontage; (2) assessed values; (3) mortgage release price.
[38] Regulations 111, Section 29.22(a)–11.
[39] O.D. 567, 3 C.B. 108.
[40] Taggart, H. F., *Subdivision Accounts*, Michigan Business Studies, Volume 2, Number 7, Ann Arbor, 1930, pp. 19–20.

### *Illustrative Problem*

X paid $40,000 for real estate acreage. At a cost of $5,000 streets were opened and the acreage divided into 50 "A" lots priced to sell at $1,200 each and 50 "B" lots priced to sell at $800 each. It was estimated that future improvements to be made by X as specified in the sales contracts would cost $15,000. During the first year, X sold 10 "A" lots and 25 "B" lots at the proposed sales prices. During the second year, X made the improvements at a cost of $13,000 and sold the remaining lots at their proposed sales prices. Present the journal entries for each year.

*Solution*

First Year

| | | |
|---|---|---|
| Real Estate Acreage | $45,000 | |
| Cash | | $45,000 |
| To record cash outlays. | | |
| Real Estate Acreage | 15,000 | |
| Reserve for Future Development Costs | | 15,000 |
| To record estimated future development costs as per problem. | | |
| Class "A" Lots | 36,000 | |
| Class "B" Lots | 24,000 | |
| Real Estate Acreage | | 60,000 |
| To allocate costs to lots upon relative sales value basis as per analysis below: | | |

| | | Proposed Sales Price | | | Allocated Cost | |
|---|---|---|---|---|---|---|
| Grade | No. | Each | Total | % | Total | Each |
| "A" | 50 | $1,200 | $ 60,000 | 60 | $36,000 | $720 |
| "B" | 50 | 800 | 40,000 | 40 | 24,000 | 480 |
| | | | $100,000 | 100 | $60,000 | |

| | | |
|---|---|---|
| Cash | $32,000 | |
| Class "A" Lots | | $ 7,200 |
| Class "B" Lots | | 12,000 |
| Profit on Sale of Lots (First Year) | | 12,800 |
| To record sales as follows: | | |

| | | Sales Price | | Cost Price | | |
|---|---|---|---|---|---|---|
| Grade | No. | Each | Total | Each | Total | Profit |
| "A" | 10 | $1,200 | $12,000 | $720 | $ 7,200 | $ 4,800 |
| "B" | 25 | 800 | 20,000 | 480 | 12,000 | 8,000 |
| | | | $32,000 | | $19,200 | $12,800 |

Second Year

| | | |
|---|---|---|
| Reserve for Future Development Costs | $15,000 | |
| Cash | | $13,000 |
| Class "A" Lots | | 960 |
| Class "B" Lots | | 400 |
| Profit on Sale of Lots (First Year) | | 640 |
| To pay deferred costs and to allocate difference between estimated and actual amounts: | | |

| Grade | No. | Proposed Sales Price Each | Proposed Sales Price Total | % | Correction Total | Correction Each |
|---|---|---|---|---|---|---|
| "A" | 50 | $1,200 | $ 60,000 | 60 | $1,200 | $24 |
| "B" | 50 | 800 | 40,000 | 40 | 800 | 16 |
| | | | $100,000 | 100 | $2,000 | |

| Grade | Lots Sold | Lots Unsold | Correction Per Lot | Last Year's Profit | Inventory |
|---|---|---|---|---|---|
| "A" | 10 | 40 | $24 | $240 | $960 |
| "B" | 25 | 25 | 16 | 400 | 400 |

| | | |
|---|---|---|
| Cash | $68,000 | |
| Class "A" Lots | | $ 27,840 |
| Class "B" Lots | | 11,600 |
| Profit on Sale of Lots (Second Year) | | 28,560 |

To record sale as follows:

| Grade | No. | Sales Price Each | Sales Price Total | Cost Price Each | Cost Price Total | Profit |
|---|---|---|---|---|---|---|
| "A" | 40 | $1,200 | $48,000 | $696 | $27,840 | $20,160 |
| "B" | 25 | 800 | 20,000 | 464 | 11,600 | 8,400 |
| | | | $68,000 | | $39,440 | $28,560 |

**Employee stock options.** The issue of stock options to employees, like installment sales above, offers an interesting example of one of the more perplexing aspects of determining periodic business income. The practice of offering stock options to key employees has grown in popularity in recent years. Such transactions have been motivated by several reasons, such as (1) the desire to encourage an employee to exert his best efforts to make the corporation a more profitable one, (2) the possibility of reducing the income tax paid by an employee, (3) the desire to disguise partially the total remuneration paid to the employees to whom options are granted.[41] The option contracts are usually associated, or tied in, with an employment agreement. As would be expected, there is no standard uniform contract. The more usual features are indicated, however, in an example such as the following: The board of directors of a corporation engages the services of a new president or other executive at a salary of $20,000 per year. At the same time, and for reasons mentioned above, a contract is entered into allowing the employee a ten-year option of purchasing 1,000 shares of stock (usually common) at a price of $50 per share, the par being $40. At the time of the contract signing, the stock is selling on the open market for $60 per share. The option is not assignable and cannot be exercised for more than 100 shares per year, with the exception that where the 100 shares are not purchased in any year, the difference accumulates. If the total of 1,000 shares has not been acquired by the employee at the end of the 10 years, the option lapses.

Many variations of the preceding option are possible. For instance, the

[41] Dillavou, 20 *Accounting Review* 321.

initial option price may be above the open market price at the time, or the option price may vary from year to year during the life of the contract.

The handling of the option contract, both at the time it is signed and at the time it is exercised, is fraught with difficulties. In the illustration cited above the option has a dollar value at the moment it is concluded, since the employee can at some time purchase 1,000 shares of stock worth $60,000 for only $50,000. Some accountants recommend that no entries be made at the time of the contract [42] other than a memo as to the number of shares required to fulfill the agreement. In this instance, no recognition is taken of the possible remuneration for services rendered to the corporation, and if the stock is eventually issued, ordinary entries would be made for the sale of the stock. Other accountants take the position that the service to be rendered by the employee should be recognized in the accounts at the time the option is signed.[43] For the example given above, the entries could be:

| | | |
|---|---|---|
| 1. Salary Expense | $10,000 | |
| Advances on Stock Options | | $10,000 |
| or | | |
| 2. Salary Expense | $10,000 | |
| Stock Option Outstanding | | $10,000 |
| or | | |
| 3. Deferred Salary Expense | $10,000 | |
| Stock Option Outstanding | | $10,000 |

If the last entry is made, the Deferred Salary Expense account would be written off to expired expense at an appropriate rate per year (usually the same amount each year).

In the opinion of the writers, the third (3) entry above is to be preferred since it indicates the accountant's attempt to match the salary expense against the fiscal periods covered by the employment contract. This view is opposed, however, by one authority who has stated:

> From a practical standpoint, the problem of valuing an option which is not transferable is difficult and may be almost insoluble. . . . there is danger in attempting to refine corporate accounting too highly. . . . Only in exceptional cases is it desirable to introduce into accounts charges against income which represent no actual cost, especially if there is no sacrifice of money or money's worth.[44]

If the employee never purchases the stock, no entry is necessary if the original agreement was simply recorded in memo form. Assuming, however, that one of the three entries above was made at the time the contract of employment was signed, a subsequent entry will have to be recorded

[42] (1946) Finney, I, 162.
[43] (1941) Paton 501.
[44] (1943) May 229, 230.

regardless of whether the option is ever exercised. If the option is allowed to lapse, the following entry would be made:

| | | |
|---|---|---|
| Stock Option Outstanding | $10,000 | |
| Donated Surplus | | $10,000 |

This entry emphasizes the fact that the employee has rendered a service to the firm and that there is no reduction in expenses simply because he does not exercise the option.[45]

If the option is taken up, the entry to be made will vary depending upon how many shares are purchased by the employee. If, for example, the employee waited until just before the option expiration date to buy the entire 1,000 shares, the entry would be:

| | | |
|---|---|---|
| Cash | $50,000 | |
| Stock Option Outstanding | 10,000 | |
| Capital Stock (Par) | | $40,000 |
| Premium on Capital Stock | | 20,000 |

If no formal entry is made at the time of signing the option, and if the employee should wait until just before the option expiration date to buy the entire 1,000 shares, one of the following entries would be made:

| | | |
|---|---|---|
| Cash | $50,000 | |
| Salary Expense | 10,000 | |
| Capital Stock (Par) | | $40,000 |
| Premium on Capital Stock | | 20,000 |

To record sale of stock to employee, assuming that the compensation inherent in the option contract is not to be recorded until the option is exercised.[46]

or

| | | |
|---|---|---|
| Cash | $50,000 | |
| Capital Stock (Par) | | $40,000 |
| Premium on Capital Stock | | 10,000 |

To record sale of stock to employee, assuming that no compensation is to be recorded on the books of the corporation.

The tax consequences of employee stock options have been the subject of considerable litigation. From the standpoint of the employee, he is usually held to have received taxable income if (1) he exercises the option and (2) it is not a "bargain purchase." [47] The corporation, however, must prove (in order to have a deduction) that the stock or option to purchase stock is given as compensation for services rendered to it. Most of the cases and rulings allow the corporate taxpayer to deduct the fair value of the

[45] (1941) Paton 501; Dillavou, 20 *Accounting Review* 322.
[46] Recommended by Dillavou, 20 *Accounting Review* 326.
[47] *Smith v. Commissioner*, 324 U.S. 177. The rule stated above is subject to certain technical exceptions, as provided for in the Revenue Act of 1950 (Section 218).

stock (less any possible payments made by the holder of the option) in the fiscal year in which the stock is delivered.[48]

The Committee on Accounting Procedure of the American Institute of Accountants has issued *Accounting Research Bulletin No. 37* in which the accounting for stock options is so cogently treated that it is quoted by permission below:

INTRODUCTION

1. The practice of granting to officers and other employees options to purchase or subscribe for shares of the corporation's capital stock has been followed by a considerable number of corporations. These options generally are a part of the corporation's cost of the services of officers and other employees, and should be accounted for as such. The amounts involved are sometimes substantial and omission of such costs from the corporation's income accounting may result in overstatement of net income to a significant degree. Accordingly, consideration is given in this bulletin to the accounting treatment of stock options involving compensation.

2. Stock options granted by corporations to their officers and other employees are presumed to be a form of compensation for services unless it is clear that they are granted primarily (a) for the purpose of raising capital or (b) to promote widespread ownership of the corporation's stock among its employees. In either of these situations, the statements made herein are not intended to apply. No differentiation is made in this bulletin as to the nature of compensation. Salaries, wages, inducements, incentives, and similar terms are all considered to be descriptive of compensation.

3. A stock option involving compensation usually arises out of an agreement between an employer corporation and an officer or other employee (hereinafter referred to as the grantee) stipulating that at a specified time or during some determinable period, at the grantee's election, and usually upon the fulfillment by the grantee of certain conditions, the corporation will issue shares of its capital stock to the grantee at a stated price. The agreement usually contains provisions specifying the period of time, or conditions, if any, which must elapse or be met, before the option may be exercised, the time the option expires, the price to be paid for the shares, and a variety of circumstances relating to the issuance of the option. It is recognized that stock options may be granted pursuant to, or even in the absence of, an announced corporate policy and without formal agreement. Although in such cases certain problems regarding the agreement date may not arise, the accounting procedures recommended herein are applicable.

ACCOUNTING PROBLEMS

4. The two principal accounting problems involved in the issuance of the type of stock options here considered are (a) the selection of the date on which the compensation is deemed to have accrued and (b) the manner in which it should be measured. Customarily, compensation is due upon performance of a service agreed upon. If compensation is paid in cash, the work is usually first performed for a stipulated period. The charge accrues during the period and payment falls due at the end of the period. In the case of compensation paid in stock as a bonus at the end of a period, the amount of the compensation is not definitely determined until the end of the period. In such cases, the amount of the compensation would be the

[48] O.D. 570; A.R.M. 114; *Haskell*, 9 B.T.A. 1087. For an excellent summary of the decisions on this point see Sax, *Taxes — The Tax Magazine*, Volume 23, p. 505.

fair value of the bonus shares at the end of the period, although there might be a recording of estimated accrual during the period.

5. In the case of options to purchase shares, the time of accrual and the amount of the compensation are not always clear. There may be as many as four dates to be considered: (a) the date of the option agreement, (b) the date when the option right becomes the property of the grantee, (c) the date on which the grantee *may* first exercise the option, and (d) the date the option *is* exercised by the grantee.

### Date of Option Agreement

6. The agreement to grant an option of the character dealt with herein states the terms under which the option will be issued. At the date of the agreement the services contemplated usually have not been performed by the grantee and no accountable obligation has been incurred by the corporation. Argument has been advanced that the worth to the corporation of the right to receive the services of the grantee should be measured as of the date of the agreement on the ground that a corporation would not purchase services without knowing the price it must pay. This argument loses much of its force when it is noted that a corporation does not always know in advance its costs for all services, as when, for example, compensation is to be calculated as a percentage of profits. The committee, therefore, believes that the date of the agreement is not *per se* the date as of which the amount of compensation involved in the option should be measured.

### Date Option Right Becomes the Property of the Grantee

7. The committee believes the date on which the option right becomes the property of the grantee is the proper date as of which to measure the value of the option. Upon that date the grantee has met all conditions precedent to receiving the option, and the corporation then has an unqualified obligation under the agreement. While this date may not coincide with the date on which the grantee may first exercise his option, the committee believes this to be the date as of which the corporation should ordinarily measure compensation resulting from the option agreement. It should be recognized that the date of the option agreement may coincide with the date at which the option right becomes the property of the grantee.

### Date Grantee May First Exercise the Option

8. The committee believes the date on which the grantee may first exercise the option is not the date as of which to measure the value of the option, unless that date happens to coincide with the date the option right becomes the property of the grantee. The fact that the date the grantee may first exercise the option differs from the date on which it becomes his property in no way changes the grantee's right to the option nor does it change in any way the corporation's obligation under the agreement. If this date follows the date on which the option right becomes the property of the grantee, it merely defers the time when the grantee may exercise the option. Such deferment could, however, affect the value of the option as of the date the option right becomes the property of the grantee.

### The Date Exercised [49]

9. The date when the option is exercised has been advocated as both the date of accrual and the time for measurement of the value of the option. Use of this

[49] Treasury Department regulations provide for recognition of compensation as of the date the option is exercised to the extent the fair value of the property exceeds the amount paid therefor. (Footnote in original bulletin)

date is supported by two principal arguments. First, only then will it be known whether or not the option will be exercised. Second, the value of the option to the grantee cannot be determined until he exercises it, and since the value to the grantee should be the equivalent of the compensation paid by the corporation, such cost should be determined as of the date the option is exercised.

10. An effective answer to the arguments in the preceding paragraph is that the corporation at the time of giving to the grantee the property right inherent in the option has then given valuable consideration for the grantee's services. If the grantee delays exercise or sale of his unrestricted right, he is speculating for his own account. If he does not exercise his option, he is in the position of having made a contribution to the corporation to the extent of the consideration given to him in the form of the option.

MANNER OF MEASUREMENT

11. When property is given for services, the cost of those services would be determined by their fair value or by the fair value of the property given, whichever is the more clearly evident.[50] While the market price of the shares will usually be an important factor and often the principal factor in determining fair value, market value is not necessarily conclusive evidence. However, there is a presumption that the value of the option should be measured by deducting the price payable by the grantee from the fair value of the shares on the date the option right becomes the property of the grantee. The amount so determined should, in most cases, represent substantially what the corporation could have realized in excess of the option price by sale of the shares on that date. When the agreement contains provisions which defer the date when the option may first be exercised, or which prevent the option from being sold or transferred, the value of the option may be less.

OTHER CONSIDERATIONS

12. When treasury shares are used by the corporation to fulfil the option agreement, the compensation is to be measured in the same way as if unissued shares had been used.

13. The entry to be made on the books should be a charge against the income account for the value of the option and a credit to an account similar to the account to which subscriptions for capital stock should be credited. If the period for which payment for services is being made by the issuance of the stock option is not specifically indicated in the agreement, the period over which the charge against income should be apportioned must be selected on the basis of the existing circumstances.

14. Until the option is exercised or expires, the existence of such option agreements and the rights outstanding under such agreements should be disclosed with appropriate explanation in the corporation's financial statements.

**Consignment sales.** Some firms make a regular practice of shipping goods out on what is called a "consignment basis." Several interesting accounting problems arise when this type of merchandising is engaged in. For instance, when is the revenue from such transactions to be reported as being realized? In reply, it may be stated that accountants traditionally have been governed by the legal consequences flowing from the shipment; that is, since legal title does not pass at the time of consignment,

[50] See *Accounting Research Bulletin No. 24*, "Accounting for Intangible Assets," p. 196. (Footnote in original bulletin)

no income is realized until the party referred to as the "consignee" has disposed of the merchandise.

From the standpoint of the consignee, the only records he must maintain are those showing what expenses he has incurred on account of the consignment, and the sale of the goods. He does this by means of an account called "Consignment-In." At intervals the consignee prepares a report (account sales) which he sends to the consignor. On this statement the consignee shows all pertinent details associated with the business transacted.

The records of the consignor may be more involved than those of the consignee since he may decide to keep the realized income from the consignment sales separate from his other types of sales. The consignor would ordinarily do this, however, only if a substantial amount of his volume of business was carried on through consignment shipments. At the time of preparing a balance sheet, the goods still unsold (and in the hands of the consignee) are included in the final inventory of the consignor at cost price plus a prorata part of all costs involved in the shipment whether incurred by the consignee or consignor.[51]

### *Illustrative Problem*

(Showing correcting and adjusting entries necessary to distinguish consignments from regular purchases and sales.)

The firm of J. Simons (1) receives goods on consignment and (2) makes shipments on consignment. The accounting procedure used in the past has made no distinction between the consignment business and regular purchases and sales. The management desires to segregate the consignments. In order to do this, the following information is gathered. Prepare journal entries to distinguish the consignments, and show the resulting trial balance.

**J. SIMONS**
**Trial Balance**
December 31, 1951

| | | |
|---|---|---|
| Cash | $ 25,136.43 | |
| Accounts Receivable | 172,133.19 | |
| Merchandise Inventory, January 1, 1951 | 172,168.94 | |
| Fixed Assets (net) | 5,281.72 | |
| Accounts Payable | | $ 183,422.65 |
| J. Simons, Capital | | 137,667.26 |
| J. Simons, Personal | 9,206.83 | |
| Sales | | 991,132.16 |
| Purchases | 743,291.87 | |
| Selling Expenses | 44,490.17 | |
| Administrative Expenses | 140,512.92 | |
| | $1,312,222.07 | $1,312,222.07 |

[51] For further details on the journal entries made by the consignee and the consignor see (1948) Newlove-Smith-White 551–554; (1947) Johnson 132–144; (1949) Karrenbrock-Simons, I, 124–126; (1942) Holmes 283–290.

During 1950, merchandise consigned outward by Simons was billed at 25 per cent above cost.

On January 1, 1951, the inventory included $42,136.50 of goods received by Simons on consignment. This amount was offset by a credit to Accounts Payable of $65,138.40 (the original billed price).

On January 1, 1951, the accounts receivable included $58,143.25 (billed price) of goods out on consignment.

During 1951, merchandise was received by Simons on consignment at a billed price of $312,145.67, the Purchases account being debited, and Accounts Payable credited.

All payments made by Simons on behalf of the consignors were charged to Selling Expenses account; these amounted to $12,934.11.

Gross sales from consigned goods on hand during 1951 amounted to $432,183.15; these were charged to Accounts Receivable and credited to Sales accounts.

During 1951, account sales were sent out by Simons to consignors showing: gross sales, $432,183.15; net proceeds, $397,612.56; selling expenses, $12,934.11 (see above); commissions earned, $21,636.48. No entry has been made for these account sales other than (1) a remittance to consignors of $351,412.94 for which Accounts Payable was debited and Cash credited, and (2) the $12,934.11 selling expenses above.

During 1951, Accounts Receivable was debited and Sales credited with $39,432.12 representing the billed price of new merchandise shipped to consignees during year. The markon in 1951 was 30 per cent above cost.

During 1951, account sales were received by Simons (none recorded as yet) showing gross sales by the consignees of $102,113.19, expenses (including commissions) of $6,981.00, and net proceeds of $95,132.19. Drafts were drawn on the consignees and $86,137.43 collected, Accounts Receivable being credited. The cost price of merchandise still on consignment out at the end of the year amounted to $13,956.38; this includes a prorata part of the deferred expenses pertaining to the consignment-out merchandise. (New York, Adapted.)

*Solution*

**Adjusting Journal Entries**
December 31, 1951

(1)

| | | |
|---|---|---|
| J. Simons, Capital | $ 42,136.50 | |
| Merchandise Inventory, January 1, 1951 | | $ 42,136.50 |
| To remove from inventory merchandise items held by J. Simons as consignee. | | |

(2)

| | | |
|---|---|---|
| Accounts Payable | 65,138.40 | |
| J. Simons, Capital | | 65,138.40 |
| To eliminate from Accounts Payable merchandise held by J. Simons as consignee and not as owner. | | |

(3)

| | | |
|---|---|---|
| Consignment-Out | $ 46,514.60 | |
| J. Simons, Capital | 11,628.65 | |
| Accounts Receivable | | $ 58,143.25 |

To remove from latter account the billed price of goods on hand with consignees still unsold on 1/1/51:
$58,143.25 = 125% of cost.
Cost = $46,514.60.
Markon = $11,628.65.

(4)

| | | |
|---|---|---|
| Accounts Payable | 312,145.67 | |
| Purchases | | 312,145.67 |

To remove from these accounts goods received by J. Simons during 1951 to be sold by him as consignee.

(5)

| | | |
|---|---|---|
| Consignment-In | 12,934.11 | |
| Selling Expenses | | 12,934.11 |

To transfer advances made on behalf of consignors of merchandise shipped to J. Simons to be sold by him as consignee, previously charged to Selling Expenses in error.

(6)

| | | |
|---|---|---|
| Sales | 432,183.15 | |
| Consignment-In | | 432,183.15 |

To remove from Sales account merchandise sold by J. Simons as consignee.

(7)

| | | |
|---|---|---|
| Consignment-In | 21,636.48 | |
| Commissions Earned | | 21,636.48 |

To charge consignors with commissions earned on goods sold for them.

(8)

| | | |
|---|---|---|
| Consignment-In | 351,412.94 | |
| Accounts Payable | | 351,412.94 |

To show amount of cash remitted by J. Simons to consignors for merchandise sold for them.

(9)

| | | |
|---|---|---|
| Sales | 39,432.12 | |
| Accounts Receivable | | 39,432.12 |

To reverse entry made when merchandise was shipped to consignees during 1951.

(10)

| | | |
|---|---|---|
| Consignment-Out | $30,332.40 | |
| Purchases | | $30,332.40 |
| To record correctly the shipments made to consignees during 1951. 130% = $39,432.12; cost = $30,332.40. | | |

(11)

| | | |
|---|---|---|
| Due from Consignees | 95,132.19 | |
| Consignment-Out | | 62,890.62 |
| Consignment-Out Profit and Loss | | 32,241.57 |
| To record the profit realized during 1951 on merchandise sold by consignees: | | |
| Balance of Consignment-Out account after entries (3) and (10) above | $76,847.00 | |
| Inventory on Consignment-Out, per problem | 13,956.38 | |
| Amount to be credited | $62,890.62 | |

(12)

| | | |
|---|---|---|
| Accounts Receivable | 86,137.43 | |
| Due from Consignees | | 86,137.43 |
| To transfer from Accounts Receivable amount remitted by consignees during year. | | |

After posting the above journal entries to the ledger accounts (omitted here to save space) the following adjusted trial balance can be prepared:

**J. SIMONS, Trial Balance**
December 31, 1951

| | | |
|---|---|---|
| Cash | $ 25,136.43 | |
| Accounts Receivable | 160,695.25 | |
| Merchandise Inventory | 130,032.44 | |
| Fixed Assets | 5,281.72 | |
| Purchases | 400,813.80 | |
| Selling Expenses | 31,556.06 | |
| Administrative Expenses | 140,512.92 | |
| Due from Consignees | 8,994.76 | |
| Accounts Payable | | $157,551.52 |
| J. Simons, Capital | | 149,040.51 |
| J. Simons, Personal | 9,206.83 | |
| Sales | | 519,516.89 |
| Consignment-Out | 13,956.38 | |
| Consignment-In | | 46,199.62 |
| Commissions Earned | | 21,636.48 |
| Consignment Profit and Loss | | 32,241.57 |
| | $926,186.59 | $926,186.59 |

**Accounting for construction contracts.**[52] While the accounting for con-

[52] A portion of this section taken from an M.B.A. thesis entitled "Contractors' Accounting," by T. J. Edwards, C.P.A. (The University of Texas Library, 1949).

struction contracts does not offer many different problems, the few which arise usually challenge the accountant to his utmost in the attempt to solve them satisfactorily. Also, in many instances the amounts involved are substantial; this adds further seriousness to the problems. The construction industry, moreover, has a total volume per year ranging in the billions of dollars.

The types of work performed by contractors have a wide range. The Bureau of the Census defines a "contractor" as follows: "This term embraces all individuals or establishments handling for others any type of new construction work, or repairing, remodeling, and jobbing, regardless of whether the work is done under contracts or otherwise." Since there are various levels or ranks within the industry, it may be well to emphasize here that the present discussion is concerned with "general contractor" which the U.S. Census Bureau defines as "one who contracts for the entire work on a given construction project directly with the owner, or his agent, is responsible for the execution of the whole, and usually does some portion of the actual work with his own construction forces." It may be mentioned, however, that the accounting for subcontractors, etc., follows somewhat the same lines as that of the general contractor.

*Types of construction contracts.* Construction contracts may be classified as follows:

1. Lump sum, or fixed price, contracts. The name assigned to this type is descriptive of their nature; that is, the contractor enters into an agreement with the owner to build something at a definite price. If something unforeseen arises, the owner may be lenient enough to pay more, but he is not usually legally required to do so.

2. Upset limit contracts. This is a term given to an agreement in which the owner promises to pay a maximum stated amount for the project, but if the cost of the project (including a percentage for profit) is less than the maximum upset limit, the owner pays the smaller sum.

3. Time and material contracts. This is a term given to an agreement in which the owner promises to pay for all of the labor and material plus an agreed profit. Since the reimbursement is often made currently each week or month, the determination of the realized revenue is easier than in the case of the other varieties of contracts, especially where the contractor's profit is based on a percentage of the direct labor and material used cost.

4. Contingent amount fee contracts. This is a term given to an agreement in which the owner promises to pay for all direct outlays on the project as well as a tentative fee which will vary depending upon whether the estimated project cost proves to be lower or higher than the actual cost. The purpose of this arrangement, of course, is to encourage the con-

tractor to keep the contract costs as low as possible, since he suffers a penalty for excess-over-estimate cost, or obtains an added bonus for savings on the job.

5. Fixed fee contracts. As the name implies, these contracts have a clause providing for a certain fee to the contractor which is not subject to adjustment at a later date. This type of contract was very popular during World War II.

6. Cost-plus contracts. In this type of contract the owner agrees to pay the contractor for all the direct costs arising from the project as well as an additional certain stated percentage of the direct costs as a profit amount for the contractor's effort and time spent in supervising the work. While this type of contract was at one time rather popular, its use has declined in recent years (especially in connection with governmental projects).

7. Unit price contracts. In this type of contract the project is divided into so-called "units" which may be based on any reasonable division of the work. The contracting parties then agree on the price per unit. As the work proceeds, the owner is sent a statement for the portion completed; the owner remits this sum, less an amount which is retained to assure the successful completion of the work. At the conclusion of the work, if it is satisfactory, the owner pays the contractor the total amount retained. This type of contract is not much different fundamentally from some of the other varieties described above, but it may offer some points of convenience to the contracting parties.

*Construction contracts in relation to the periodicity of income.* One of the major accounting problems in the business of a contractor is associated with the difficulty of determining just how much income has been realized by the firm each fiscal period. Many contracts are entered into which require a year or more to complete. This means that if the usual test of realization is employed (namely, the securing of cash or the legal equivalent of cash), no income would be reported until the job is finished and accepted by the customer. In support of the usual test of revenue realization, the following arguments may be presented:

1. The acceptance of the job by the customer is the most convincing evidence of the satisfactory completion of the work; therefore, any plan of reporting revenue realization prior to completion contains a considerable element of chance.

2. If any other plan is adopted, dividends may be paid to stockholders based on reported income which may never be collected.

3. If any other plan is adopted, the income tax paid may be based on reported income which is erroneous; in some instances the tax paid may not be subject to a refund.

4. This plan is more conservative than any others.

5. Since the other plans are based on an estimate of partial completion, there is always a possibility that errors in the estimate will occasion misleading reports.

The principal alternative method of reporting the periodic revenue realization in a contracting firm is often referred to as the percentage-of-completion plan. This technique employs (1) an estimate of the stage of completion of the project at the end of any given reporting period and (2) the use of this estimate to prorate the total expected revenue on the job to the period covered by the income statement being prepared at the moment. In support of this plan of revenue realization, the following arguments may be presented:

1. Most business firms make a practice of reporting some income or loss each period, at least if they are in active operation. (In case of a single contract running for several years, the firm would show no profit or loss under the usual test of income realization.)

2. If necessary or desirable, the estimates of partial completion can be tempered to allow for a safety factor.

3. The plan does not discriminate against short-term investors and noncumulative preferred stockholders.

4. The plan does not cause large sums of income tax to become due all in one period.

5. Since some cash is collected by the contractor at each estimate date, there is even further reason for reporting a portion of the revenue as being realized; in other words, the question of the availability of funds for dividends, etc., is settled.

It should be observed that accountants are in agreement that under the cost-plus type of contract the revenue should be reported as the work progresses, but there is no consensus when the other varieties of contracts are in effect. The authors believe, however, that the percentage-of-completion plan offers more advantages than the first method noted above.

*Technique employed under the percentage-of-completion method.* As noted previously, an estimate of the extent of completion is essential to this plan of reporting periodic revenue. Actually, however, there are several variations of the general technique which have been suggested:

1. Ratio of accumulated cost to date as compared with the total estimated cost of the project

2. Percentage of physical completion of the project

3. Ratio of progress billings to the total contract price applied to total estimated revenue to be derived from the job

4. Ratio of time already spent on job to total estimated time required for completion

5. The lower of the ratio of billings rendered to total project price, or

the ratio of accumulated costs to date to total estimated cost applied to the total project price

6. Ratio of materials cost to date to total estimated material cost

7. Measurement of revenue realization on the basis of a cost-plus contract

8. Applied judgment of the amount of realized revenue based on a combination of the above possible variations

The first variation mentioned above has the support of many accountants. The arithmetic used in this instance is:

$$\frac{\text{Cost of project to this date}}{\text{Total estimated cost}} \times \text{Estimated total revenue} = \text{Total revenue realized to this date}$$

Of course, if the revenue from the project has already been partially reported, the previous amounts would be deducted from the results found in the equation above to determine the dollars to be shown on the current income statement.

The technique employed in the other variations of the general plan could be similarly illustrated. Space does not allow for a more extended treatment of these variations in this volume.

*Retained percentages or amounts.* In many contracts a provision is inserted calling for the retention by the owner of a certain dollar amount or percentage until the project is completed. In other words, the owner promises to pay the contractor in periodic installments based on partial completion of the job, but these installments are subject to a withholding to assure satisfaction on the work. In some contracts the amount retained is paid over to the contractor at completion, but in other cases the withheld sum is not collectible by the builder for a year or more. The latter provision is a type of guaranty for performance of any needed repairs.

The question arises as to whether the retained percentage amount should be included in the determination of the contractor's periodic revenue. The usual conclusion is that retained percentages for the purpose only of assuring the completion of the project do constitute a portion of the base for measuring realized revenue. Percentages retained to guarantee against defects or to insure maintenance for a stipulated period of time after completion should also be reported as revenue, but a Reserve for Defects or a Reserve for Maintenance should be set up by charges to the costs of contracts completed. The amounts entered in these reserves are based on estimates, tempered of course by the past experience of the contractor.

To illustrate the two methods, assume a contract calling for retained percentages of 10 per cent of billings as a guarantee against defects. The owner is billed for $100,000 and the estimated cost of making good on defects is 5 per cent of billings.

**Retained percentages not income**

| | | |
|---|---|---|
| Accounts Receivable — Current | $90,000 | |
| Accounts Receivable — Retained Percentages | 10,000 | |
| Contract Sales | | $ 90,000 |
| Reserve for Defective Work | | 10,000 |
| Owner billed for $100,000 subject to 10 per cent retained for guarantee against defects. | | |

**Retained percentages are income**

| | | |
|---|---|---|
| Accounts Receivable — Current | $90,000 | |
| Accounts Receivable — Retained Percentages | 10,000 | |
| Contract Sales | | $100,000 |
| Owner billed for $100,000 subject to 10 per cent retained for guarantee against defects. | | |
| Cost of Contracts Completed | 5,000 | |
| Reserve for Defective Work | | 5,000 |
| To set up reserve based on past experience. | | |

*Contracts in progress on the balance sheet.* During the interval that a contract is in progress, the question will arise as to how it should be presented on the balance sheet prepared at the end of each time interval used for the reports.

When the completed contract method of reporting realized revenue is followed there are two ways of showing the work in progress. The first procedure is to present as an asset, or as deferred credit as the case may be, the uncompleted work at a figure which represents the difference between cost to date and the billings to the owner. The second procedure is to present the cost of the uncompleted work as an asset and to present the billings as a deferred credit.

When the percentage-of-completion method is followed, there are three ways of showing the work in progress. The first method is to absorb all costs in the Profit and Loss account, and thus no work in progress will be shown as such on the balance sheet. The second method is to show the work in progress (as an asset) at cost to date plus any revenue which has been reported as being realized. The third method is to show those costs as a current asset which have not been absorbed in the Profit and Loss account.

### *Illustrative Problems*

In the following illustrative problems and solutions will be indicated the procedures and practices which, in the writers' opinion, reflect the results of the operations of a construction company.

#### Cost-Plus Contracts

On January 1, 1951, the Acme Construction Company was awarded a cost-plus contract to construct an office building for the First National Bank. The contract

stipulates that the contractor is to bill the owner at the end of each month for the actual cost of construction plus 15 per cent of such costs. The First National Bank is to retain 5 per cent of the amount billed to guarantee the completion of the work by the contractor and remit 95 per cent of the amount billed to the contractor on or before the fifteenth of the following month. The building is to be completed on or before June 30, 1952.

**Journal Entries**

| | | |
|---|---|---|
| Various dates, January, 1951 | | |
| Labor | $ 40,000 | |
| Materials | 50,000 | |
| Overhead | 20,000 | |
| Various Accounts | | $110,000 |
| To record the costs incurred for labor, materials, and overhead during January, 1951. | | |
| Various dates, January, 1951 | | |
| Contract in Progress | 102,000 | |
| Labor | | 40,000 |
| Materials | | 40,000 |
| Overhead | | 20,000 |
| Cash | | 2,000 |
| To record the costs actually applied to the contract during January, 1951. | | |
| January 31, 1951 | | |
| Accounts Receivable — Current | 111,435 | |
| Accounts Receivable — Retained Percentage | 5,865 | |
| Contract Sales | | 117,300 |
| First National Bank billed for cost of construction during January plus 15 per cent. | | |
| January 31, 1951 | | |
| Cost of Contracts Completed | 102,000 | |
| Contract in Progress | | 102,000 |
| First National Bank billed for cost of construction during January. | | |
| February 15, 1951 | | |
| Cash | 111,435 | |
| Accounts Receivable — Current | | 111,435 |
| Check received from First National Bank for billings for January construction less 5 per cent retained. | | |

Journal entries similar to those above would be made each month throughout the construction period. In order to illustrate the balance sheet and the income statement under this type of contract, assume that the Acme Construction Company ends its fiscal year on December 31 each year and that the First National Bank was billed for $115,000 for the month of December, 1951. Assume that the First National Bank project is the only one undertaken during the year and that the owner has been billed for $2,300,000 during the year. The statements would appear as follows:

**ACME CONSTRUCTION COMPANY**
**Statement of Income**
For the Year Ended December 31, 1951

| | | |
|---|---|---|
| Contract Sales | | $2,300,000 |
| Less Cost of Contracts Completed | | 2,000,000 |
| Gross Profit on Contract Sales | | $ 300,000 |
| Less Operating Expenses: | | |
| General and Administrative Expenses | $70,000 | |
| Selling Expenses | 10,000 | 80,000 |
| Net Profit from Operations | | $ 220,000 |
| Financial Expense | | 3,000 |
| Income before Income Taxes | | $ 217,000 |
| Provision for Federal Income Taxes | | 60,000 |
| Income for the Year | | $ 157,000 |

**ACME CONSTRUCTION COMPANY**
**Balance Sheet**
December 31, 1951

ASSETS

| | | | |
|---|---|---|---|
| Current Assets: | | | |
| Cash | | $100,000 | |
| Accounts Receivable — Current | | 109,250 | |
| Accounts Receivable — Retained Percentages | | 115,000 | |
| Materials and Supplies | | 20,000 | |
| Prepaid Insurance | | 1,750 | |
| Total Current Assets | | | $346,000 |
| Fixed Assets: | | | |
| Furniture and Fixtures | $ 10,000 | | |
| Less Reserve for Depreciation | 2,000 | $ 8,000 | |
| Equipment | $600,000 | | |
| Less Reserve for Depreciation | 125,000 | 475,000 | |
| Total Fixed Assets | | | 483,000 |
| Total Assets | | | $829,000 |

LIABILITIES AND CAPITAL

| | | | |
|---|---|---|---|
| Current Liabilities: | | | |
| Accounts Payable | $25,000 | | |
| Notes Payable | 50,000 | | |
| Accrued Federal Income Taxes | 60,000 | | |
| Total Current Liabilities | | $135,000 | |
| Fixed Liabilities: | | | |
| Bonds Payable | | 100,000 | |
| Total Liabilities | | | $235,000 |
| Capital Stock and Surplus: | | | |
| Common Stock, $100 par value, 4,000 shares issued and outstanding | | $400,000 | |
| Earned Surplus | | 194,000 | |
| Total Capital Stock and Surplus | | | 594,000 |
| Total Liabilities and Capital | | | $829,000 |

It may be noted that there is nothing very unusual about the income statement. In the balance sheet, it should be observed that there is no work in process shown as all costs of construction up to December 31, 1951, have been closed to Profit and Loss. It may also be noted that the retained percentages are shown as a current asset since they are expected to become collectible within less than one year. The retained percentages on this contract are to be paid upon the completion of the work by the contractor.

The following illustrative problem will be solved by both the completed contract method and the percentage-of-completion method of accounting for profits:

The Burns Construction Company obtains a contract to construct a warehouse for the Jones Wholesale Grocer Company on January 10, 1951. The contract stipulates that the warehouse is to be completed on or before July 15, 1951. The Burns Construction Company contracted to construct the warehouse for $300,000, and the Jones Wholesale Grocer Company is to remit to the contractor 90 per cent of the architect's estimate of percentage of completion on April 15, 1951, and 90 per cent of the balance on the architect's acceptance of the project as completed. The 10 per cent retained is to guarantee against defective work and is to be remitted to the contractor six months after completion of the contract if all defective work is made good. The contractor estimates that this project will cost $260,000 and thus estimates his profit at $40,000.

On February 1, 1951, the Burns Construction Company obtains a contract to construct an office building for $3,000,000 for the Ajax Insurance Company to be completed on or before August 1, 1952. The architect is to estimate the degree of completion of the contract on June 30, 1951, December 31, 1951, June 30, 1952, and upon completion of the project. Based upon the architect's certificates, the Ajax Insurance Company is to remit to the contractor 90 per cent of the sales price for the percentage of work completed and retain 10 per cent until six months after the completion of the project to guarantee against defective work. The contractor estimates the cost of this project to be $2,650,000 and his profit at $350,000. The Burns Construction Company ends its fiscal year on December 31.

### Completed Contract Method

The entries pertaining to the Jones Wholesale Grocer Company contract would be as follows:

January 10, 1951

| | | |
|---|---|---|
| Awarded Contracts | $300,000 | |
| Uncompleted Contracts | | $300,000 |
| To record the contract. | | |

January 10, 1951, to April 15, 1951

| | | |
|---|---|---|
| Contract in Progress | 145,000 | |
| Labor | | 50,000 |
| Materials | | 70,000 |
| Overhead | | 20,000 |
| Cash | | 5,000 |
| To record the costs actually applied to the contract during the period Jan. 10 to Apr. 15, 1951. | | |

| | | |
|---|---|---|
| April 16, 1951 | | |
| Accounts Receivable — Current | $135,000 | |
| Accounts Receivable — Retained Percentage | 15,000 | |
| Billings on Contracts in Progress | | $150,000 |
| To record architect's certificate that the project is 50 per cent completed. | | |
| Uncompleted Contracts | 150,000 | |
| Awarded Contracts | | 150,000 |
| Project 50 per cent completed. | | |
| April 15, 1951, to June 20, 1951 | | |
| Contract in Progress | 110,000 | |
| Labor | | 35,000 |
| Materials | | 55,000 |
| Overhead | | 17,000 |
| Cash | | 3,000 |
| To record the costs actually applied to the contract during period April 15 to June 20, 1951. | | |
| June 20, 1951 | | |
| Accounts Receivable — Current | 135,000 | |
| Accounts Receivable — Retained Percentage | 15,000 | |
| Billings on Contracts in Progress | 150,000 | |
| Contract Sales | | 300,000 |
| To record architect's certificate that the project is 100 per cent completed. | | |
| Uncompleted Contracts | 150,000 | |
| Awarded Contracts | | 150,000 |
| Project 100 per cent completed. | | |
| Cost of Contracts Completed | 261,000 | |
| Contract in Progress | | 255,000 |
| Reserve for Defective Work | | 6,000 |
| To record the cost of contract completed and set up a reserve for defective work at 2 per cent of sales price, percentage being based on past experience with this type of contract. | | |
| June 20, 1951, to December 20, 1951 | | |
| Reserve for Defective Work | 3,500 | |
| Cash | | 3,500 |
| To record cost of making good defective work. | | |
| December 20, 1951 | | |
| Cash | 30,000 | |
| Accounts Receivable — Retained Percentage | | 30,000 |
| To record collection of retained percentage. | | |
| Reserve for Defective Work | 2,500 | |
| Cost of Contracts Completed | | 2,500 |
| To close the reserve for defective work on the Jones Wholesale Grocer Company contract. | | |

The entries pertaining to the Ajax Insurance Company contract would be as follows:

February 1, 1951

| | | |
|---|---|---|
| Awarded Contracts | $3,000,000 | |
| Uncompleted Contracts | | $3,000,000 |
| To record the contract. | | |

February 1, 1951, to June 30, 1951

| | | |
|---|---|---|
| Contract in Progress | 900,000 | |
| Labor | | 350,000 |
| Materials | | 450,000 |
| Overhead | | 95,000 |
| Cash | | 5,000 |
| To record the costs actually applied to the contract during period Feb. 1 to June 30, 1951. | | |

June 30, 1951

| | | |
|---|---|---|
| Accounts Receivable — Current | 837,000 | |
| Accounts Receivable — Retained Percentage | 93,000 | |
| Billings on Contracts in Progress | | 930,000 |
| To record architect's certificate that the project is 31 per cent completed. | | |
| Uncompleted Contracts | 930,000 | |
| Awarded Contracts | | 930,000 |
| Project 31 per cent completed. | | |

June 30, 1951, to December 31, 1951

| | | |
|---|---|---|
| Contract in Progress | 900,000 | |
| Labor | | 350,000 |
| Materials | | 450,000 |
| Overhead | | 95,000 |
| Cash | | 5,000 |
| To record the costs actually applied to the contract during period June 30 to Dec. 31, 1951. | | |
| Cash | 837,000 | |
| Accounts Receivable — Current | | 837,000 |
| To record collection. | | |

December 31, 1951

| | | |
|---|---|---|
| Accounts Receivable — Current | 999,000 | |
| Accounts Receivable — Retained Percentage | 111,000 | |
| Billings on Contracts in Progress | | 1,110,000 |
| To record architect's certificate that the project is 68 per cent completed. (.68 × $3,000,000) − $930,000 = $1,110,000. | | |
| Uncompleted Contracts | 1,110,000 | |
| Awarded Contracts | | 1,110,000 |
| Project 68 per cent completed. | | |

December 31, 1951, to June 25, 1952

| | | |
|---|---|---|
| Contract in Progress | $ 800,000 | |
| Labor | | $ 350,000 |
| Materials | | 375,000 |
| Overhead | | 70,000 |
| Cash | | 5,000 |

To record the costs actually applied to the contract during period Dec. 31, 1951 to June 25, 1952.

June 25, 1952

| | | |
|---|---|---|
| Accounts Receivable — Current | 864,000 | |
| Accounts Receivable — Retained Percentage | 96,000 | |
| Billings on Contracts in Progress | 2,040,000 | |
| Contract Sales | | 3,000,000 |

To record architect's certificate that the project is 100 per cent completed.

| | | |
|---|---|---|
| Uncompleted Contracts | 960,000 | |
| Awarded Contracts | | 960,000 |

Project 100 per cent completed.

| | | |
|---|---|---|
| Cost of Contracts Completed | 2,630,000 | |
| Contract in Progress | | 2,600,000 |
| Reserve for Defective Work | | 30,000 |

To record the cost of contract completed and set up reserve for defective work at 1 per cent of sales price, percentage based on past experience with this type of contract.

June 25, 1952, to December 25, 1952

| | | |
|---|---|---|
| Reserve for Defective Work | 35,000 | |
| Cash | | 35,000 |

To record cost of making good on defective work.

December 25, 1952

| | | |
|---|---|---|
| Cash | 300,000 | |
| Accounts Receivable — Retained Percentage | | 300,000 |

To record collection of retained percentage.

| | | |
|---|---|---|
| Cost of Contracts Completed | 5,000 | |
| Reserve for Defective Work | | 5,000 |

To close the reserve for defective work on the Ajax Insurance Company contract.

The financial statements for the Burns Construction Company on December 31, 1951, would appear as follows:

**BURNS CONSTRUCTION COMPANY**
**Statement of Income**
For the Year Ending December 31, 1951

| | |
|---|---|
| Contract Sales | $300,000 |
| Less Cost of Contracts Completed | 258,500 |
| Gross Profit on Contract Sales | $ 41,500 |

| | | |
|---|---|---|
| Gross Profit on Contract Sales (detailed on page 509) | | $41,500 |
| Less Operating Expenses: | | |
| General and Administrative Expenses | $10,000 | |
| Selling Expenses | 4,000 | 14,000 |
| Net Profit from Operations | | $ 27,500 |
| Financial Expense | | 1,000 |
| Income before Income Taxes | | $ 26,500 |
| Provision for Federal Income Taxes | | 6,000 |
| Income for the Year | | $ 20,500 |

**BURNS CONSTRUCTION COMPANY**
**Balance Sheet**
December 31, 1951

ASSETS

| | | | |
|---|---|---|---|
| Current Assets: | | | |
| Cash | | $ 150,000 | |
| Accounts Receivable — Current | | 999,000 | |
| Accounts Receivable — Retained Percentage | | 204,000 | |
| Materials and Supplies | | 40,000 | |
| Prepaid Insurance | | 2,000 | |
| Total Current Assets | | | $1,395,000 |
| Fixed Assets: | | | |
| Furniture and Fixtures | $ 10,000 | | |
| Less Reserve for Depreciation | 2,000 | $ 8,000 | |
| Equipment | $800,000 | | |
| Less Reserve for Depreciation | 200,000 | 600,000 | |
| Total Fixed Assets | | | 608,000 |
| Total Assets | | | $2,003,000 |

LIABILITIES AND CAPITAL

| | | | |
|---|---|---|---|
| Current Liabilities: | | | |
| Accounts Payable | $ 450,000 | | |
| Notes Payable | 50,000 | | |
| Accrued Federal Income Taxes | 6,000 | | |
| Total Current Liabilities | | $ 506,000 | |
| Deferred Credits: | | | |
| Billings on Contracts in Progress | $2,040,000 | | |
| Less Contracts in Progress | 1,800,000 | | |
| Deferred Credits to Income | | 240,000 | |
| Total Liabilities and Deferred Credits | | | $ 746,000 |
| Capital Stock and Surplus: | | | |
| Common Stock, $100 par value, 10,000 shares issued and outstanding | | $1,000,000 | |
| Earned Surplus | | 257,000 | |
| Total Capital Stock and Surplus | | | 1,257,000 |
| Total Liabilities and Capital | | | $2,003,000 |

### PERCENTAGE-OF-COMPLETION METHOD

The entries illustrated under the completed contract method for the Jones Wholesale Grocer Company contract are also appropriate under the percentage-

of-completion method since this contract was started and completed in the same fiscal year.

The entries pertaining to the Ajax Insurance Company contract would be as follows under the percentage-of-completion method:

February 1, 1951

| | | |
|---|---|---|
| Awarded Contracts | $3,000,000 | |
| Uncompleted Contracts | | $3,000,000 |
| To record the contract. | | |

February 1, 1951, to June 30, 1951

| | | |
|---|---|---|
| Contract in Progress | 900,000 | |
| Labor | | 350,000 |
| Materials | | 450,000 |
| Overhead | | 95,000 |
| Cash | | 5,000 |
| To record the costs actually applied to the contract during period Feb. 1 to June 30, 1951. | | |

June 30, 1951

| | | |
|---|---|---|
| Accounts Receivable — Current | 837,000 | |
| Accounts Receivable — Retained Percentage | 93,000 | |
| Contract Sales | | 930,000 |
| To record architect's certificate that the project is 31 per cent completed. | | |
| Uncompleted Contracts | 930,000 | |
| Awarded Contracts | | 930,000 |
| Project 31 per cent completed. | | |
| Cost of Contracts Completed | 909,300 | |
| Contract in Progress | | 900,000 |
| Reserve for Defective Work | | 9,300 |
| To record the cost of contract completed and set up reserve for defective work at 1 per cent of sales price, percentage being based on past experience with this type of contract. | | |

June 30, 1951, to December 31, 1951

| | | |
|---|---|---|
| Contract in Progress | 900,000 | |
| Labor | | 350,000 |
| Materials | | 450,000 |
| Overhead | | 95,000 |
| Cash | | 5,000 |
| To record the costs actually applied to the contract during period June 30 to Dec. 31, 1951. | | |

December 31, 1951

| | | |
|---|---|---|
| Accounts Receivable — Current | 999,000 | |
| Accounts Receivable — Retained Percentage | 111,000 | |
| Contract Sales | | 1,110,000 |
| To record architect's certificate that the project is 68 per cent completed. | | |

| | | |
|---|---|---|
| Uncompleted Contracts | $1,110,000 | |
| Awarded Contracts | | $1,110,000 |
| Project 68 per cent completed. | | |
| Cost of Contracts Completed | 911,100 | |
| Contract in Progress | | 900,000 |
| Reserve for Defective Work | | 11,100 |
| To record the cost of contract completed and set up reserve for defective work at 1 per cent of sales price. | | |

December 31, 1951, to June 25, 1952

| | | |
|---|---|---|
| Contract in Progress | 800,000 | |
| Labor | | 350,000 |
| Materials | | 375,000 |
| Overhead | | 70,000 |
| Cash | | 5,000 |
| To record the costs actually applied to the contract during period Dec. 31, 1951 to June 25, 1952. | | |

June 25, 1952

| | | |
|---|---|---|
| Accounts Receivable — Current | 864,000 | |
| Accounts Receivable — Retained Percentage | 96,000 | |
| Contract Sales | | 960,000 |
| To record architect's certificate that the project is 100 per cent completed. | | |
| Uncompleted Contracts | 960,000 | |
| Awarded Contracts | | 960,000 |
| Project 100 per cent completed. | | |
| Cost of Contracts Completed | 809,600 | |
| Contracts in Progress | | 800,000 |
| Reserve for Defective Work | | 9,600 |
| To record the cost of contract completed and set up reserve for defective work at 1 per cent of sales price. | | |

June 25, 1952, to December 25, 1952

| | | |
|---|---|---|
| Reserve for Defective Work | 35,000 | |
| Cash | | 35,000 |
| To record cost of making good defective work. | | |

December 25, 1952

| | | |
|---|---|---|
| Cash | 300,000 | |
| Accounts Receivable — Retained Percentage | | 300,000 |
| To record collection of retained percentage. | | |
| Cost of Contracts Completed | 5,000 | |
| Reserve for Defective Work | | 5,000 |
| To close the reserve for defective work on the Ajax Insurance Company contract. | | |

The financial statements on December 31, 1951, would appear as follows:

**BURNS CONSTRUCTION COMPANY**
**Statement of Income**
For the Year Ending December 31, 1951

| | | |
|---|---|---|
| Contract Sales | | $2,340,000 |
| Less Cost of Contracts Completed | | 2,078,900 |
| Gross Profit on Contract Sales | | $ 261,100 |
| Less Operating Expenses: | | |
| General and Administrative Expenses | $10,000 | |
| Selling Expenses | 4,000 | 14,000 |
| Net Profit from Operations | | $ 247,100 |
| Financial Expense | | 1,000 |
| Income before Income Taxes | | $ 246,100 |
| Provision for Federal Income Taxes | | 60,000 |
| Income for the Year | | $ 186,100 |

**BURNS CONSTRUCTION COMPANY**
**Balance Sheet**
December 31, 1951

ASSETS

| | | | |
|---|---|---|---|
| Current Assets: | | | |
| Cash | | $ 150,000 | |
| Accounts Receivable — Current | | 999,000 | |
| Accounts Receivable — Retained Percentages | | 204,000 | |
| Materials and Supplies | | 40,000 | |
| Prepaid Insurance | | 2,000 | |
| Total Current Assets | | | $1,395,000 |
| Fixed Assets: | | | |
| Furniture and Fixtures | $ 10,000 | | |
| Less Reserve for Depreciation | 2,000 | $ 8,000 | |
| Equipment | $800,000 | | |
| Less Reserve for Depreciation | 200,000 | 600,000 | |
| Total Fixed Assets | | | 608,000 |
| Total Assets | | | $2,003,000 |

LIABILITIES AND CAPITAL

| | | |
|---|---|---|
| Current Liabilities: | | |
| Accounts Payable | $ 450,000 | |
| Notes Payable | 50,000 | |
| Accrued Federal Income Taxes | 60,000 | |
| Reserve for Defective Work | 20,400 | |
| Total Current Liabilities | | $ 580,400 |
| Capital Stock and Surplus: | | |
| Common Stock, $100 par value, 10,000 shares issued and outstanding | $1,000,000 | |
| Earned Surplus | 422,600 | |
| Total Capital Stock and Surplus | | 1,422,600 |
| Total Liabilities and Capital | | $2,003,000 |

In the above illustration, the percentage of physical completion method was used in computing the income on the contract. If independent architect's or engineer's certificates are not available, it is more accurate to use the percentage of cost of completion method for computing the income. Incidentally, if the percentage of physical completion method is used, the reliability of the results should be tested by the use of the percentage of cost of completion method, since both methods often yield substantially the same dollar results.

# CHAPTER 15

## Foreign Branches and Subsidiaries

**Introduction.** The problems associated with the conversion into domestic currency of assets and liabilities located in foreign countries constitute an interesting example of the periodicity factor and business income. By way of introduction to these problems, it may be observed that wherever a domestic firm conducts operations in a foreign country, either through a branch or a subsidiary corporation, it becomes necessary at intervals to combine or consolidate the balance sheets and the income statements of the parent corporation or home office with those of the foreign unit. Since it is customary for the transactions of the foreign unit to be recorded in the monetary system peculiar to the country in which it is located, the trial balance of the foreign unit must be converted to dollars before the combining or consolidating can be accomplished. While it would be possible simply to convert the foreign trial balance into dollars at a fixed rate of exchange (and thus avoid several complicating factors), such a procedure would ignore the fact that the foreign branch or subsidiary did not acquire the assets and incur its liabilities at just one rate of exchange. In addition, the expenses, expired costs, and revenues of the foreign business unit were not all realized at one time and thus should not be converted at, say, the rate governing at any one instant of time. The use of varying conversion rates of exchange, however, causes the converted trial balance debit total to differ from the credit total. On some occasions this difference may be a substantial amount; for example, the 1948 annual report of Standard Oil Company (New Jersey) indicated a figure in excess of five million dollars.

In order to indicate the technique involved in handling the accounts of a foreign branch the following illustrative problem and solution are presented:

### *Illustrative Problem*

On January 1, the X Company had the following post-closing trial balance:

| | | | |
|---|---|---|---|
| Cash | $ 60,000 | Accounts Payable | $ 68,000 |
| Accounts Receivable | 45,000 | Capital Stock | 250,000 |
| Inventory (900 units) | 180,000 | Surplus (Earned) | 50,000 |
| Fixed Assets | 90,000 | Reserve for Doubtful Accounts | 2,000 |
| | | Reserve for Depreciation | 5,000 |
| | $375,000 | | $375,000 |

On January 2, a branch in London was started by buying fixed assets costing £8,000. During January, the home office bought 1,250 units of goods at $200 paying $185,000 on account. The shipments to the branch were: January 2, 96

units, and January 15, 723 units. The credit sales during January were: Home office 400 units for $140,000 and branch 578 units for £40,000. Cash collections during January were: Home office $150,000 and branch £32,000. Estimated depreciation was: Home office $3,000 and branch £2,000. Cash expenses were: Home office $15,000 and branch £3,000. Estimated bad debts expense was: Home office $6,000 and branch £500. Accrued taxes payable were: Home office $15,000 and branch £2,000. Cash remitted to home office January 25, £18,000. Inventories (valued on first-in, first-out principle) were: Home office 931 units and branch 241 units. A controlling account for expenses other than cost of goods sold was maintained at each office. The exchange rates on sterling were: January 2, $4.80; January 15, $4.82; January 25, $4.84; January 31, $4.86; average for January, $4.83.

Give journal entries on the home office and branch books.

*Solution*

**Operating Journal Entries**

| | Home Office | | London Branch | |
|---|---|---|---|---|
| London Branch Current | $ 38,400 | | | |
| Fixed Assets | | | £ 8,000 | |
| Cash | | $ 38,400 | | |
| Home Office Current | | | | £ 8,000 |
| To record fixed assets. | | | | |
| Purchases | 250,000 | | | |
| Cash | | 185,000 | | |
| Accounts Payable | | 65,000 | | |
| To record purchases. | | | | |
| London Branch Current | 19,200 | | | |
| Shipments from Home Office | | | 4,000 | |
| Shipments to Branch | | 19,200 | | |
| Home Office Current | | | | 4,000 |
| For January 2 shipment. | | | | |
| London Branch Current | 144,600 | | | |
| Shipments from Home Office | | | 30,000 | |
| Shipments to Branch | | 144,600 | | |
| Home Office Current | | | | 30,000 |
| For January 15 shipment. | | | | |
| Accounts Receivable | 140,000 | | 40,000 | |
| Sales | | 140,000 | | 40,000 |
| For credit sales. | | | | |
| Cash | 150,000 | | 32,000 | |
| Accounts Receivable | | 150,000 | | 32,000 |
| For collections. | | | | |
| Expense Control | 39,000 | | 7,500 | |
| Reserve for Depreciation | | 3,000 | | 2,000 |
| Cash | | 15,000 | | 3,000 |
| Reserve for Doubtful Accounts | | 6,000 | | 500 |
| Accrued Taxes Payable | | 15,000 | | 2,000 |
| For expenses. | | | | |

| | Home Office | | London Branch | |
|---|---|---|---|---|
| Cash | $ 87,120 | ..... | ..... | ..... |
| Remittances to Home Office | ..... | ..... | £18,000 | ..... |
| Remittances from Branch | ..... | $ 87,120 | ..... | ..... |
| Cash | ..... | ..... | ..... | £18,000 |
| For remittance. | | | | |
| Inventory | 6,200 | ..... | 10,000 | ..... |
| Cost of Goods Sold | ..... | 6,200 | ..... | 10,000 |
| For inventories. | | | | |
| Cost of Goods Sold | 86,200 | ..... | 34,000 | ..... |
| Shipments to Branch | 163,800 | ..... | ..... | ..... |
| Shipments from Home Office | ..... | ..... | ..... | 34,000 |
| Purchases | ..... | 250,000 | ..... | ..... |
| For purchases and shipments. | | | | |
| Sales | ..... | ..... | 40,000 | ..... |
| Home Office Current | ..... | ..... | 9,500 | ..... |
| Expense Control | ..... | ..... | ..... | 7,500 |
| Cost of Goods Sold | ..... | ..... | ..... | 24,000 |
| Remittance to Home Office | ..... | ..... | ..... | 18,000 |
| To close branch books. | | | | |

Before the home office trial balance (in dollars) can be combined with the foreign branch trial balance, the latter must be converted to domestic currency units (see work sheet below). (The conversion "rates" to be used for the several accounts are discussed in the next section.) The debits and credits on the converted trial balance are made to equal each other by inserting a line and amount entitled "Exchange Adjustment." This latter account may have either a debit or credit balance, depending upon the circumstances of each case (see discussion in later section below).

**Pre-closing Trial Balances and Conversion Work Sheet**

(For discussion of "Rates" see later section of this chapter.)

| | | Branch Office | | | | |
|---|---|---|---|---|---|---|
| *Debits* | Home Office Trial Balance | Unconverted Trial Balance | Rates | Converted Trial Balance | Profit and Loss | Balance Sheet |
| Cash | $ 58,720 | £11,000 | $4.86 | $ 53,460 | ..... | $ 53,460 |
| Accounts Receivable | 35,000 | 8,000 | 4.86 | 38,880 | ..... | 38,880 |
| Inventory (Initial) | 180,000 | ..... | ..... | ..... | ..... | ..... |
| Fixed Assets | 90,000 | 8,000 | 4.80 | 38,400 | ..... | 38,400 |
| London Branch Current | 202,200 | ..... | ..... | ..... | ..... | ..... |
| Purchases | 250,000 | ..... | ..... | ..... | ..... | ..... |
| Expense Control | 39,000 | 7,500 | 4.83 | 36,225 | $ 36,225 | ..... |
| Shipments from Home Office | ..... | 34,000 | (a) | 163,800 | 163,800 | ..... |
| Remittances to Home Office | ..... | 18,000 | (a) | 87,120 | ..... | 87,120 |
| | $854,920 | £86,500 | ..... | $417,885 | ..... | ..... |
| Inventory (Final) | ..... | £10,000 | 4.82 | ..... | ..... | 48,200 |
| Net Profit (Branch) | ..... | ..... | ..... | ..... | 41,375 | ..... |
| | | | | | $241,400 | $266,060 |

| *Credits* | Home Office Trial Balance | Branch Office: Unconverted Trial Balance | Rates | Branch Office: Converted Trial Balance | Profit and Loss | Balance Sheet |
|---|---|---|---|---|---|---|
| Reserve for Doubtful Accounts | $ 8,000 | £ 500 | $4.86 | $ 2,430 | ..... | $ 2,430 |
| Reserve for Depreciation | 8,000 | 2,000 | 4.80 | 9,600 | ..... | 9,600 |
| Accounts Payable | 133,000 | ..... | ..... | ..... | ..... | ..... |
| Sales | 140,000 | 40,000 | 4.83 | 193,200 | $193,200 | ..... |
| Shipments to Branch | 163,800 | ..... | ..... | ..... | ..... | ..... |
| Home Office Current | ..... | 42,000 | (a) | 202,200 | ..... | 202,200 |
| Capital Stock | 250,000 | ..... | ..... | ..... | ..... | ..... |
| Surplus (Earned) | 50,000 | ..... | ..... | ..... | ..... | ..... |
| Remittances from Branch | 87,120 | ..... | ..... | ..... | ..... | ..... |
| Accrued Taxes Payable | 15,000 | 2,000 | 4.86 | 9,720 | ..... | 9,720 |
| Exchange Adjustment | ..... | ..... | (b) | 735 | ..... | 735 |
| | $854,920 | £86,500 | ..... | $417,885 | ..... | ..... |
| Inventory (Final) | ..... | £10,000 | 4.82 | ..... | 48,200 | ..... |
| Net Profit (Branch) | ..... | ..... | ..... | ..... | ..... | 41,375 |
| | | | | | $241,400 | $266,060 |

(a) U.S. dollar value of reciprocal account.
(b) Amount needed to make converted statement balance

### Entries to Close Home Office Books

| | | |
|---|---|---|
| Remittance from Branch | $ 87,120 | |
| London Branch Profit and Loss | | $ 41,375 |
| London Branch Current | | 45,745 |
| To take up branch's profits and close Remittance account. | | |
| Sales | 140,000 | |
| London Branch Profit and Loss | 41,375 | |
| Expense Control | | 39,000 |
| Cost of Goods Sold | | 80,000 |
| Surplus (Earned) | | 62,375 |
| To close home office books. | | |

The post-closing converted trial balances of the home office and the branch (after closing the Remittances to Home Office account) are:

| | Home Office | Branch Office |
|---|---|---|
| Cash | $ 58,720 | $ 53,460 |
| Accounts Receivable | 35,000 | 38,880 |
| Final Inventory | 186,200 | 48,200 |
| Fixed Assets | 90,000 | 38,400 |
| London Branch Current | 156,455 | ..... |
| | $526,375 | $178,940 |
| Reserve for Doubtful Accounts | $ 8,000 | $ 2,430 |
| Reserve for Depreciation | 8,000 | 9,600 |
| Accounts Payable | 133,000 | ..... |
| Accrued Taxes Payable | 15,000 | 9,720 |
| Capital Stock | 250,000 | ..... |
| Surplus (Earned) | 112,375 | ..... |
| Reserve for Exchange Fluctuations* | ..... | 735 |
| Home Office Current | ..... | 156,455 |
| | $526,375 | $178,940 |

* See discussion in later section of this chapter; this line could also be called "Exchange Adjustment."

**Conversion of account balances of foreign branches and subsidiaries.**[1] *Axioms.* The assumptions underlying the conversion of accounts involving foreign currencies are as follows:

1. The financial statements are presented in terms of the currency of the country where the owners of that business are domiciled; the currency of the owners' country is viewed as the fixed or stable currency, and the foreign currency as the fluctuating currency regardless of which currency actually is fluctuating.

2. The net assets abroad are to be recorded, as much as is practicable, at their cost to the owners.

3. Both the balance sheet and income statement aspects of any transaction should be converted at the same rate; exceptions are justified only on the grounds of expediency.

4. As far as practicable, operating costs and incomes should be matched against each other to secure the branch's operating income. Exchange losses and gains, which should be differentiated from operating income, should be classified as to whether they are realized or unrealized. Realized exchange losses and gains must always be taken up by the home office, but unrealized exchange losses need not be recorded if the assets subject to the unrealized exchange losses and gains will be sold or used in future operations which may be expected to be profitable after the results are converted into domestic currency.

*Fixed assets.* Fixed asset acquisitions, incurred in foreign currency, should be converted at the rates of exchange prevailing when the expenditures were incurred. This general procedure is subject to the following refinements:

1. Losses and gains may arise if funds are sent abroad in connection with a fixed asset expenditure program and the exchange rate changes before the expenditure is actually made, and if a fixed asset acquisition is financed by a bank loan abroad and the exchange rate changes before the bank is reimbursed. Such losses should normally be charged to Profit and Loss,[2] but the gains should be credited to the Fixed Asset account.[3]

2. If the construction costs of fixed assets and the production costs of current assets are paid for out of moneys that can be identified as to transfers from the home office, the construction and production accounts should be debited with the foreign moneys spent and the dollar cost thereof com-

[1] Cutforth, 89 *The Accountant* 135–145, 177–180; Aveyard, 92 *The Accountant* 781–783; (1925) Cutforth (entire book); *Accounting Research Bulletin No. 4;* (1933) Taylor-Miller, II, 63–73; (1934) Finney, II, 454–459; (1948) Johnson 279–283; Berger, J. A., *Foreign Branch Accounting* (Chicago: La Salle Extension University, 1940), pp. 28–40.

[2] *Bernuth Lembcke Co.*, 1 B.T.A. 1051; Cutforth, 89 *The Accountant* 137–138.

[3] Cutforth, 89 *The Accountant* 137–138.

puted on the first-in, first-out rule [4] or on the average cost basis.[5] As outlays usually cannot be identified with transfers from the home office, fixed asset acquisitions are usually converted as follows: [6]

a. Wages paid in foreign currency for fixed asset construction should be converted at the average rate of exchange during the period. The length of the period used must be governed by the degree of variability of the rates and the uniformity of the production over the time involved. If the construction expenditures and the exchange rates both fluctuate widely, a weighted average exchange should be used.

b. Materials purchased abroad that are used for fixed asset acquisition purposes should be converted at the rate prevailing at the date of their purchase. Materials shipped from the home office that are used in fixed asset construction should be converted at the cost to the home office.

c. Burden or overhead applicable to fixed asset acquisitions that represent outlays in foreign currency should be converted by dealing with totals monthly, quarterly, half-yearly, or yearly, and then converting these totals at the respective average exchange rates.

3. Fixed assets owned by a subsidiary at date of affiliation should be converted at the rate prevailing when the holding company made its stock investment.[7]

4. Retirements of fixed assets should be converted at the rate prevailing at date of purchase.[8] The salvage value of retired fixed assets should be converted at the rate existing at date of retirement.[9]

5. While additions to fixed assets should be converted at the rates prevailing at the dates of purchase,[10] the average rate for the period of purchase may be used if the other rates are not available.[11]

6. Very frequently the fixed assets and the depreciation reserve are carried on the home office rather than on the branch books, and the periodic depreciation expense is charged to the branch (converted at the rate prevailing when the fixed assets were purchased).[12]

7. If the depreciation reserve is on the branch books, its balance is converted at the rate prevailing when the fixed assets were purchased. If several rates are involved because the fixed assets were acquired at several dates, conversion may conveniently be made by dividing the unconverted

[4] Walton-Finney, 29 *Journal of Accountancy* 225–227; (1928) Collins 486–487; (1934) Finney, II, 452.
[5] (1934) Finney, II, 452.
[6] Cutforth, 89 *The Accountant* 136–139; (1925) Cutforth 67–69.
[7] (1935) Baumann-Gordon 312–316.
[8] (1935) Baumann-Gordon 158; (1939) Kohler 299.
[9] (1939) Kohler 299.
[10] (1939) Kohler 303.
[11] (1932) Finney-Baumann-Gordon 15; (1931) Taylor-Miller 393; (1939) Kohler 299; Carter, R. N., *Advanced Accounts* (London: Sir Isaac Pitman & Sons, Ltd., 1933), p. 727.
[12] (1948) Johnson 281, 283; Carter, *op. cit.*, p. 730.

fixed assets valuation into the unconverted depreciation reserve balance and then multiplying the converted fixed assets valuation by the quotient.[13]

*Quick current assets and liabilities.* The general rule that cash, receivables, notes and accounts payable, and accrued assets and liabilities should be converted at the rate of exchange prevailing at the date of the balance sheet is subject to the following refinements:

1. Accounts payable covered by the purchase of foreign exchange futures should be converted at the cost of the foreign exchange futures contracts.[14]

2. Accounts payable in domestic currency should be segregated from the ordinary accounts payable and should be converted at their face value in U.S. currency.[15]

3. Intercompany accounts payable should be converted at the rates in effect on the dates of the transactions in order that they may be eliminated in consolidation.[16]

4. Cash in restricted foreign currency should be segregated from ordinary cash and converted at the rate of exchange existing at date of balance sheet; a special reserve should then be deducted to reduce the value to the total expected to be realized by the home office or parent company.[17]

5. Changes in exchange rates between the date of the balance sheet and the date on which the statement is prepared do not affect the rate of conversion; an earned surplus reserve may, of course, be established to indicate the possible loss.[18]

6. Accounts receivable or cash balances covered by the forward sale of foreign currency should be converted at the forward sale rate.[19]

7. The Reserve for Doubtful Accounts should be converted at the current rate.[20]

*Unsold merchandise from home office.* Usually, merchandise inventories of goods shipped from the home office are converted at the cost to the home office,[21] but sometimes the use of the rate existing at the date of the inventory is recommended.[22] A final inventory of goods purchased abroad in U.S. funds should be converted at the cost in U.S. currency.[23] Freight money paid in foreign funds applicable to unsold merchandise shipped by

[13] (1933) Taylor-Miller, II, 70.
[14] Baumann, 70 *Journal of Accountancy* 539; (1941) Baumann-Gordon 90; Saliers, 19 *Accounting Review* 378.
[15] (1925) Cutforth 66; (1935) Baumann-Gordon 32.
[16] Baumann, 70 *Journal of Accountancy* 81; (1941) Baumann-Gordon 46.
[17] *Ibid.*
[18] Cutforth, 89 *The Accountant* 137–138.
[19] Aveyard, 92 *The Accountant* 781.
[20] (1933) Kester 640; Baumann, 57 *Journal of Accountancy* 290; (1939) Kohler 297; (1948) Johnson 282.
[21] Aveyard, 92 *The Accountant* 781; (1931) Pace-Bryan (SC–30); (1941) Taylor-Miller 302–303; (1939) Kohler 297; (1948) Johnson 283.
[22] (1927) Montgomery 661; (1934) Finney, II, 457–459.
[23] (1935) Baumann-Gordon 32.

the home office should be converted at the rate existing at the date of shipment; an American Institute problem (November, 1933), however, forced the use of the current rate by not giving the rate at date of shipment.

*Unsold merchandise bought in foreign currency.* Inventories acquired abroad for foreign currency are converted at the rate existing at the date of the inventory in American practice [24] and at the rate existing at date of purchase in English practice.[25] As the rate existing at date of purchase determines the cost of both cash and credit purchases of merchandise abroad for U.S. income tax purposes,[26] many American accountants follow the English rule.

*Use of lower of cost or market rule.* After the merchandise inventories have been converted into domestic currency, the valuation is still subject to the possible application of the lower of cost or market rule for valuation.[27]

*Deferred charges.* The American practice of converting deferred charges at the exchange rate existing at date of balance sheet [28] is only justified on the grounds of expediency. Whenever practicable the following refinements should be made:

1. Discount and premium on bonds payable should be converted at the rate used to convert the bonds.

2. Inventories of supplies (stores) should be treated like inventories of merchandise. This procedure is in accordance with English practice.[29]

3. Prepaid expenses, like unexpired insurance, should be converted at cost whenever there are considerable balances to be spread over succeeding fiscal periods.

English practice converts revenue expenditures in local currency at the average rate of exchange, and unused inventories at end of the period at the current rate of exchange, but handles stores shipped from England upon a "standard basis." This results in following the American practice as to stores purchased in the fluctuating currency and refinement No. 2 above for stores shipped from England. The following example illustrates English practice: [30]

Stores costing £1,500 in England were received abroad on January 1 by an American branch which used half of the stores in repairing buildings

[24] (1927) Montgomery 661; (1931) Pace-Bryan (SC–30); (1935) Baumann-Gordon 32; (1939) Kohler 297; Baumann, 70 *Journal of Accountancy* 81; (1941) Baumann-Gordon 46.

[25] Cutforth, 89 *The Accountant* 141; Aveyard, 92 *The Accountant* 781.

[26] *Joyce-Koebel Co.*, 6 B.T.A. 403.

[27] Cutforth, 89 *The Accountant* 142; Aveyard, 92 *The Accountant* 781; Baumann, 70 *Journal of Accountancy* 81; (1941) Baumann-Gordon 46; (1925) Cutforth 92.

[28] (1928) Collins 489; (1931) Taylor-Miller 392; (1931) Pace-Bryan (SC–30); (1939) Baumann-Gordon 75; (1941) Taylor-Miller 302; (1939) Kohler 297.

[29] Cutforth, 89 *The Accountant* 141; Aveyard, 92 *The Accountant* 781.

[30] (1925) Cutforth 75–87; Carter, *op. cit.*, pp. 742–748.

during the year and had the rest on hand at the end of the year; the rates of exchange (pence to a dollar) were: January 1, 10*d.*; December 31, 8*d.*; average for year, 9*d.*

The American practice of converting used stores at the average rate of exchange and unused stores at the current rate of exchange causes the stores which originally cost the home office £1,500 to be converted at £1,275 as follows:

£1,500 converted on January 1 rate (10*d.*) is $36,000; the branch would take up the stores at $36,000, charge $18,000 to repairs and have $18,000 stores on hand. The ending balances would then be converted as follows:

| | |
|---|---|
| $18,000 (repairs) converted at average rate [(18,000 × 9) ÷ 240] . . . | £ 675 |
| $18,000, (stores on hand) converted at current rate [(18,000 × 8) ÷ 240] | 600 |
| Total (obviously incorrect) . . . . . | £1,275 |

The correct valuations may be obtained by the use of "standard dollars" memorandum columns in the accounts (standard $ of 1*s.* 6*d.* chosen for ease of conversion). The recommended accounts are shown on page 524.

NOTES

a. £1,500 converted into standard 1*s.* 6*d.* dollars: (1,500 × 20) ÷ 1.5 = 20,000; into currency dollars at 10*d.*: (1,500 × 240) ÷ 10 = 36,000.
b. Issues recorded during year in detail ledgers only; the end of the year conversion is made on the total of all issues so does not involve much clerical work.
c. 10,000 standard 1*s.* 6*d.* dollars converted at the average rate of exchange (9*d.*): 10,000 × 1.5 × 12/9 = 20,000; 20,000 currency dollars converted at 9*d.*: (20,000 × 9) ÷ 240 = 750.
d. 10,000 standard 1*s.* 6*d.* dollars converted at the current rate of exchange (8*d.*): 10,000 × 1.5 × 12/8 = 22,500; 22,500 currency dollars converted at 8*d.*: (22,500 × 8) ÷ 240 = 750.
e. Amount needed to balance currency column of Stores account in branch books recorded also in Currency Column in Home Office Current account and Branch Current account.

*Sinking funds.* Sinking funds should be converted at the same rate used to convert the bonds for whose redemption the funds were established. The Committee on Accounting Procedure of the American Institute of Accountants recommends that a series of bonds to be retired in 10 equal annual payments in currency and corresponding receipts from assets sold on the deferred payment system falling due at or about the same time as the payments due to the bondholders, be converted at the same rate of exchange.[31]

*Fixed liabilities.* The general rule that fixed liabilities should be converted

[31] *Accounting Research Bulletin No. 4.*

## BRANCH ACCOUNTS (Kept in New York)

### Stores Account

| | Standard $ (Memo) | Rate of Exchange | Currency $ |
|---|---|---|---|
| Jan. 1 Receipt | 20,000 | (a) | 36,000 |
| Dec. 31 Adjust Currency Column in Home Office Current (e) | ..... | ... | 6,500 |
| | 20,000 | | 42,500 |
| Jan. 1 Balance | 10,000 | 8 | 22,500 |

| | Standard $ (Memo) | Rate of Exchange | Currency $ |
|---|---|---|---|
| Issues | 10,000 | (b)9(c) | 20,000 |
| Dec. 31 Inventory | 10,000 | 8(d) | 22,500 |
| | 20,000 | | 42,500 |

### Home Office Current Account

| | £ (Memo) | Rate of Exchange | Currency $ |
|---|---|---|---|
| Dec. 31 Repairs Closed | 750 | 9(c) | 20,000 |
| Dec. 31 Balance | 750 | 8(d) | 22,500 |
| | 1,500 | | 42,500 |

| | £ (Memo) | Rate of Exchange | Currency $ |
|---|---|---|---|
| Jan. 1 Stores Received | 1,500 | 10(a) | 36,000 |
| Dec. 31 Adjust Stores Account Currency Column | .... | ... | 6,500 |
| | 1,500 | | 42,500 |
| Dec. 31 Balance | 150 | 8 | 22,500 |

### Building Repairs Account

| | $ |
|---|---|
| Stores Issued | 20,000 |

| | $ |
|---|---|
| Dec. 31Closed | 20,000 |

## HOME OFFICE ACCOUNTS (Kept in London)

### Branch Current Account

| | $ (Memo) | Rate of Exchange | £ |
|---|---|---|---|
| Jan. 1 Shipment | 36,000 | 10(a) | 1,500 |
| Dec. 31 Adjust Currency Column in Branch Current (e) | 6,500 | ... | .... |
| | 42,500 | | 1,500 |
| Jan. 1 Balance | 22,500 | 8 | 750 |

| | $ (Memo) | Rate of Exchange | £ |
|---|---|---|---|
| Dec. 31 Branch Repairs | 20,000 | 9(c) | 750 |
| Dec. 31 Balance | 22,500 | 8(d) | 750 |
| | 42,500 | | 1,500 |

### Repairs to Branch Account

| | £ |
|---|---|
| Dec. 31 Repairs | 750 |

### Accounts Payable (for Stores)

| | £ |
|---|---|
| Jan. 1 Bought for Shipment | 1,500 |

at the rate of exchange existing when the fixed liabilities were issued is subject to the following refinements:

1. Fixed liabilities outstanding at date of affiliation should be converted at the rate prevailing when the parent purchased the subsidiary.[32]

2. A maturing installment of a funded debt should be converted at the current rate of exchange.[33]

3. When the branch has sufficient resources to retire a bond issue and there is a considerable spread between the rate at the issuance of the bonds and the rate at the date of balance sheet, the bonds may be converted at the current rate, or both the bonds and the fixed assets of the branch may be converted at the par of the exchange.[34] The present authors prefer to convert at the current rate of exchange and to set up the profit in a special unrealized profit reserve.

*Capital stock and paid-in surplus of subsidiary.* The capital stock of a foreign subsidiary should be converted at the rate existing at date of affiliation.[35]

*Earned surplus of subsidiary.* The earned surplus of a foreign subsidiary should be divided into three amounts, as follows:[36]

1. Balance at date of acquisition, which should be converted at the rate existing at date of affiliation.

2. Balance earned since date of acquisition and up to the start of the current period, which should be converted at the figure needed to balance the balance sheet at the start of the current period.

3. Balance earned during current period, which should be converted at the figure needed to balance the balance sheet at the end of the current period.

*Nominal accounts.* The expense and income accounts normally are converted at the average rate of exchange for the period or periods. In regard to the length of the period in respect to which the average rate of exchange should be taken, similar remarks apply as in the case of the construction of fixed assets (see paragraph 2*a* under Fixed Assets above). As accuracy requires that an item be converted at the same rate for both the balance sheet and the income statement, the following exceptions should be made to the use of the average rate of exchange for nominal accounts:

1. Depreciation should be converted at the rate of exchange used for the conversion of the fixed assets.

2. Purchases of merchandise and supplies from the home office should be converted at cost to the main office.

[32] (1935) Baumann-Gordon 312–316.
[33] (1935) Baumann-Gordon 158; *Accounting Research Bulletin No. 4.*
[34] Aveyard, 92 *The Accountant* 789.
[35] (1931) Taylor-Miller 392; (1935) Baumann-Gordon 33; (1939) Kohler 297; Berger, *op. cit.*, p. 32.
[36] (1939) Kohler 297–298.

3. Any expense that occurs sporadically in reasonably large amounts, like taxes or bond interest, should be converted at the rate existing when the accrued liability was paid. If the liability is unpaid, both the expense and the liability should be converted at the current rate.

4. When prepaid expenses are large enough to warrant recording them in both foreign and domestic currencies, the periodic amortization should be converted at the rate existing when the asset was secured (see paragraph 3 under Deferred Charges above).

5. Bad debt expense should be converted at the current rate. Some accountants recommend, however, the use of the average rate.

*Reciprocal accounts.* The branch reciprocal accounts should be converted at the dollar balance of the reciprocal accounts on the home office books. These reciprocal accounts are:

| *Branch Account Balance* | Converted to balance of — | *Home Office Account* |
|---|---|---|
| Shipments to Home Office | | Shipments from Branch |
| Shipments from Home Office | | Shipments to Branch |
| Remittances from Home Office | | Remittances to Branch |
| Remittances to Home Office | | Remittances from Branch |
| Home Office Current | | Branch Current |

**Exchange conversion rates after devaluation of foreign currencies.** During the past two decades there have been several instances where foreign countries have devalued their monetary units by percentages which have caused sizable losses and gains to United States firms doing business (and having property) in those countries. While the general principles discussed in the preceding section are applicable to many of the post-devaluation situations, the problems are sometimes serious enough to warrant some departure from the rules expressed above. The Research Department of the American Institute of Accountants has made a careful study of this matter [37] and a portion of its report follows:

*Losses from Devaluation.* . . . it should be noted that the committee on accounting procedure in *Accounting Research Bulletin No. 32* emphasized that only when charges of the type described therein are material in the aggregate in relation to the company's net income, do they upset the general presumption that all items of profit and loss should be used in determining net income. While the possibility of losses from currency devaluation may ordinarily be considered to be a risk inherent in the conduct of business in foreign countries, the world-wide scope and unprecedented magnitude of the recent devaluations of foreign currencies are such that they cannot be considered recurrent hazards of business. Accordingly, the losses resulting from such devaluation would appear to be of such a nature that, if they are so material in amount that their inclusion in the income statement would

[37] 89 *Journal of Accountancy* 36–38 (quoted by permission).

impair the significance of net income to an extent that misleading inferences might be drawn therefrom, they might appropriately be charged to retained income (surplus) under the provisions of *Bulletin No. 32*.

*Operations.* In many cases it may be desirable to follow the recommendations of *Bulletin No. 4*, which would result in the application of both pre- and post-devaluation rates to the operations of a single year. There may, however, be situations in which more realistic results would be obtained if income computed in foreign currencies were to be translated for the entire fiscal year at the post-devaluation rates. This procedure would have the practical advantage of making it unnecessary to cut off at the date of the devaluation. Where dividends have been paid prior to the devaluation date, out of earnings of the current fiscal year, that portion of the income for the year should be considered as having been earned at the pre-devaluation rate irrespective of the rate that may be used in translating the remainder of the earnings accumulated prior to the devaluation date.

There may be cases in which the income statement would present very misleading results if the pre-devaluation exchange rates were used for a large part of the fiscal year, and the loss resulting from the fall in exchange rates were charged to retained income (surplus). Obviously, the charge to income for the fall in exchange should not be less than the loss applicable to the increase in net current assets since the beginning of the fiscal year during which devaluation took place.

*Fixed Assets.* Generally, the rule for translation of fixed assets at rates in effect when the asset was acquired or constructed should be followed. One exception to the rule might be with respect to current plant additions when income is translated at post-devaluation rates. Another exception might be with respect to fixed assets acquired with foreign capital, to which reference is made later. When, however, fixed assets are purchased with United States dollars, or when they are purchased in foreign currencies, presumably out of profits which are not restricted as to withdrawal, the United States dollar cost or the dollar equivalent of the foreign currency at the date of purchase should be recognized as the amount at which such assets should be carried.

*Long-term Liabilities.* Translation of long-term liabilities presents possibly the greatest deviation from the principles previously stated by the committee. The committee generally has favored translating long-term liabilities at the rates of exchange prevailing when the liability was actually contracted, but recognized that there were exceptions. The purpose was to avoid giving recognition to minor fluctuations in foreign currencies. The argument has been advanced, however, and apparently without satisfactory rebuttal, that long-term bonds will be paid off in post-devaluation currencies and therefore should be translated at post-devaluation rates. This argument may not be compelling in any given instance, but the logic supporting it is convincing for a fall in rates of the breadth and size of the one just witnessed. Accordingly, with respect to long-term bonds, the general rule should be modified to permit translation at post-devaluation rates.

Under certain circumstances, the gain resulting from restating the long-term debt at the lower rates of exchange may appropriately be offset against the loss arising from translation of net current assets. However, when fixed assets held in the foreign country were acquired with funds obtained in that country, it may be appropriate to restate the fixed assets to the extent of the reduction of the related debt.

*Capital Stock.* Consideration also should be given to the rates at which capital stocks stated in foreign currencies are to be translated; whether they should be

translated at historical rates, or at the average of rates applicable to the net assets, or at the post-devaluation rates, would depend on the circumstances in the individual cases.

**Foreign manufacturing branch or agency.** A branch may be established in a foreign country for the purpose of extracting a local raw material or for manufacturing a product to be shipped to the home office. The chief accounting problem of such a branch is that of ascertaining costs. In general it may be said that the standards of accounting applied in recording the operations of a domestic manufacturing concern together with a logical application of the standards and procedures developed for foreign branches are used in accounting for foreign manufacturing branches.

What is the proper measure of cost in dollars of a manufactured product or of a plant or other asset constructed at the foreign branch, where materials, labor, and expenses are paid by the branch in foreign currency? The authors believe that the appropriate measure of the cost of such assets is the price paid by the home office for the foreign moneys expended by the branch in the manufacture or construction; of course this answer must assume that there has been no unnecessary exchange risk taken through remitting funds to the branch in excess of the anticipated needs. Since the funds remitted to the branch may be sent periodically to the branch or obtained by the branch through drafts drawn on the home office, in either case at varying exchange rates, it is usually expedient for the branch to keep its accounts so as to be able to identify the particular funds expended or otherwise facilitate the determination of their cost. This may be done by keeping the branch accounts in both currencies, and pricing the foreign currency in dollars at the time of expenditure by using one of the methods of deriving costs for inventories, such as the first-in, first-out, specific cost, or average cost methods.

*Illustrative Problem*

A New York corporation owns a plant in a South American country. The accounts in that country are kept in pesos. The following account is complete except as to the conversion of the expenditures:

**Cash Account**

| | Dollars | Pesos | | Dollars | Pesos |
|---|---|---|---|---|---|
| 2/2 Draft | 30,000 | 120,000 | 2/7 Nitrate | | 90,000 |
| 2/9 Draft | 30,000 | 150,000 | 2/7 Plant | | 30,000 |
| 2/16 Draft | 30,000 | 180,000 | 2/14 Nitrate | | 90,000 |
| 2/23 Draft | 30,000 | 150,000 | 2/14 Plant | | 30,000 |
| | | | 2/21 Nitrate | | 90,000 |
| | | | 2/21 Plant | | 30,000 |
| | | | 2/28 Nitrate | | 90,000 |
| | | | 2/28 Plant | | 30,000 |

There was no nitrate on hand on February 1, but on February 28 only 80 per cent of the nitrate produced during the month was shipped. The plant was carried on the New York books. The average quoted exchange rates for each week (pesos in cents): First week 22, second 19, third 16, and fourth 18.

Assuming that the only element entering into the costs of construction and production in the South American country was labor, give the Home Office Current, Operations, and Cash accounts on the branch's books and the branch trial balance converted on February 28, if the cable rate valued a peso at 16 cents.

This problem is unusual in that it is possible to identify the pesos going into both production and construction. This ordinarily would not be the case; therefore two solutions are given, the first using the first-in, first-out principle of converting the pesos, and the second converting at the average weekly rate of exchange.

*Solution — Pesos Identified*

The application of the first-in, first-out principle to the conversion of the pesos to determine the cost of the plant and of the manufactured nitrate is as follows:

| | Plant | | | Nitrate | | |
|---|---|---|---|---|---|---|
| | Pesos | Rate | Dollars | Pesos | Rate | Dollars |
| Proceeds of Feb. 2 Draft: | | | | | | |
| Issued Feb. 7 | 30,000 | $.25 | $7,500 | 90,000 | $.25 | $22,500 |
| Proceeds of Feb. 9 Draft: | | | | | | |
| Issued Feb. 14 | 30,000 | .20 | 6,000 | 90,000 | .20 | 18,000 |
| Issued Feb. 21 | 7,500 | .20 | 1,500 | 22,500 | .20 | 4,500 |
| Proceeds of Feb. 16 Draft: | | | | | | |
| Issued Feb. 21 | 22,500 | .16⅔ | 3,750 | 67,500 | .16⅔ | 11,250 |
| Issued Feb. 28 | 22,500 | .16⅔ | 3,750 | 67,500 | .16⅔ | 11,250 |
| Proceeds of Feb. 23 Draft: | | | | | | |
| Issued Feb. 28 | 7,500 | .20 | 1,500 | 22,500 | .20 | 4,500 |

Unissued 120,000 pesos costing $24,000.

These expenditures are entered in the accounts as follows:

**Cash Account**

(Pesos issued converted on first-in, first-out basis)

| | Dollars | Pesos | | Dollars | Pesos |
|---|---|---|---|---|---|
| 2/2 Home Office. | 30,000 | 120,000 | 2/7 Nitrate | 22,500 | 90,000 |
| 2/9 Home Office. | 30,000 | 150,000 | 2/7 Plant. | 7,500 | 30,000 |
| 2/16 Home Office. | 30,000 | 180,000 | 2/14 Nitrate | 18,000 | 90,000 |
| 2/23 Home Office. | 30,000 | 150,000 | 2/14 Plant. | 6,000 | 30,000 |
| | | | 2/21 Nitrate | 15,750 | 90,000 |
| | | | 2/21 Plant. | 5,250 | 30,000 |
| | | | 2/28 Nitrate | 15,750 | 90,000 |
| | | | 2/28 Plant. | 5,250 | 30,000 |
| | | | 2/28 Balance | 24,000 | 120,000 |
| | 120,000 | 600,000 | | 120,000 | 600,000 |
| 2/28 Balance | 24,000 | 120,000 | | | |

**Home Office Current Account**

(Pesos issued converted on first-in, first-out basis)

| | Dollars | Pesos | | Dollars | Pesos |
|---|---|---|---|---|---|
| 2/7 Cash (Plant). . | 7,500 | 30,000 | 2/2 Cash . . . . | 30,000 | 120,000 |
| 2/14 Cash (Plant). . | 6,000 | 30,000 | 2/9 Cash . . . . | 30,000 | 150,000 |
| 2/21 Cash (Plant). . | 5,250 | 30,000 | 2/16 Cash . . . . | 30,000 | 180,000 |
| 2/28 Cash (Plant). . | 5,250 | 30,000 | 2/23 Cash . . . . | 30,000 | 150,000 |
| 2/28 Operations (Shipment) . | 57,600 | 288,000 | | | |
| 2/28 Balance . . . | 38,400 | 192,000 | | | |
| | 120,000 | 600,000 | | 120,000 | 600,000 |
| | | | 2/28 Balance . . . | 38,400 | 192,000 |

**Operations Account**

(Pesos issued converted on first-in, first-out basis)

| | Dollars | Pesos | | Dollars | Pesos |
|---|---|---|---|---|---|
| 2/7 Cash . . . . | 22,500 | 90,000 | 2/28 Home Office (Shipment). . | 57,600 | 288,000 |
| 2/14 Cash . . . . | 18,000 | 90,000 | 2/28 Inventory. . . | 14,400 | 72,000 |
| 2/21 Cash . . . . | 15,750 | 90,000 | | | |
| 2/28 Cash . . . . | 15,750 | 90,000 | | | |
| | 72,000 | 360,000 | | 72,000 | 360,000 |

**South American Country Trial Balance**

(Pesos converted on first-in, first-out basis)

| | Dollars | Pesos | | Dollars | Pesos |
|---|---|---|---|---|---|
| Cash . . . . . | 24,000 | 120,000 | Home Office Current. | 38,400 | 192,000 |
| Inventory . . . . | 14,400 | 72,000 | | | |
| | 38,400 | 192,000 | | 38,400 | 192,000 |

*Solution — Pesos Not Identified*

If the South American branch was buying supplies from and selling nitrate to outsiders, the pesos expended on construction and on manufacture could not be identified as being a part of the funds supplied by the home office. Then pesos used in capital expenditure would be charged at the rate of exchange ruling when the outlay was made (average for week as work was done continuously). If nitrate is to be sold to outsiders as well as shipped to the United States, the Operations account would be kept only in pesos, and the peso cost of shipments to the home office would be converted at the rate of exchange at the date of shipment. The following accounts show the entries that would have been made for the transactions given in the problem if additional transactions are assumed to have been made with outsiders.

**Excerpt from Cash Account**

(Assumed entries with outsiders not shown)

| | Pesos | | Pesos |
|---|---|---|---|
| 2/2 Home Office | 120,000 | 2/7 Nitrate | 90,000 |
| 2/9 Home Office | 150,000 | 2/7 Plant | 30,000 |
| 2/16 Home Office | 180,000 | 2/14 Nitrate | 90,000 |
| 2/23 Home Office | 150,000 | 2/14 Plant | 30,000 |
| | | 2/21 Nitrate | 90,000 |
| | | 2/21 Plant | 30,000 |
| | | 2/28 Nitrate | 90,000 |
| | | 2/28 Plant | 30,000 |
| | | 2/28 Balance | 120,000 |
| | 600,000 | | 600,000 |
| 2/28 Balance | 120,000 | | |

**Home Office Current Account**

(Pesos issued not identified)

| | Dollars | Pesos | | Dollars | Pesos |
|---|---|---|---|---|---|
| 2/7 Cash (Plant) | 6,600 | 30,000 | 2/2 Cash | 30,000 | 120,000 |
| 2/14 Cash (Plant) | 5,700 | 30,000 | 2/9 Cash | 30,000 | 150,000 |
| 2/21 Cash (Plant) | 4,800 | 30,000 | 2/16 Cash | 30,000 | 180,000 |
| 2/28 Cash (Plant) | 5,400 | 30,000 | 2/23 Cash | 30,000 | 150,000 |
| 2/28 Operations (Shipment) | 46,080 | 288,000 | | | |
| 2/28 Balance | 51,420 | 192,000 | | | |
| | 120,000 | 600,000 | | 120,000 | 600,000 |
| | | | 2/28 Balance | 51,420 | 192,000 |

**Operations Account**

(Pesos issued not identified)

| | Pesos | | Pesos |
|---|---|---|---|
| 2/7 Cash | 90,000 | 2/28 Home Office (Shipment costing 288,000 pesos converted at 16¢, or $46,080) | 288,000 |
| 2/14 Cash | 90,000 | | |
| 2/21 Cash | 90,000 | | |
| 2/28 Cash | 90,000 | 2/28 Inventory | 72,000 |
| | 360,000 | | 360,000 |
| 2/28 Inventory | 72,000 | | |

If the pesos cannot be identified and if the inventory is for sale to outsiders as well as for shipment to the home office, both the cash and inventory should be converted at the current rate of exchange.

**South American Country Trial Balance**

(Pesos not identified)

| | Pesos | Rate | Dollars |
|---|---|---|---|
| Cash | 120,000 | $.16 | 19,200 |
| Inventory | 72,000 | .16 | 11,520 |
| | 192,000 | | 30,720 |
| Home Office Current | 192,000 | | 30,720 |

**Exchange adjustment account.** In the foreign branch illustrative problem given in a previous section of this chapter, it was noted that the sum of $735 was inserted on the credit side of the converted trial balance to make the debit total equal the credit total. This $735 represents the "exchange adjustment" required according to the facts given in the problem. In some instances the insertion of a debit exchange adjustment figure is required. Whether the amount of the exchange adjustment is a debit or a credit, and whether it is large or small, depends upon several factors, such as (1) extent of fluctuation in foreign exchange during the period, (2) how long the branch has been in operation, (3) scope of operations of the branch, and (4) whether the fixed assets of the branch are carried on the home office books or the branch books (conversion rates on fixed assets may differ under the two possibilities).

The procedure adopted in the individual case for the disposition of the Exchange Adjustment account will cause the reported periodic income to vary, depending upon the exact presentation adopted. There are at least three possible techniques available, and each of these has, of course, its adherents. They are: (1) Consider the exchange adjustment each year as an item to be reflected in its entirety in the reported income or loss of the branch.[38] Under this procedure there would be no "carrying forward" of the exchange adjustment amount and it would be presented on the branch income statement as a gain or loss (usually considered a nonoperating item). While this treatment is advisable for income tax purposes [39] (since net income not remitted must be converted for tax purposes at the rate of exchange in effect at the end of the year), the position taken by the Bureau of Internal Revenue is illogical. This illogicalness is caused by the fact that the revenues (and thus the net income or loss) of a business unit are realized ordinarily from day to day, while remittances of net income are customarily made only at fairly long intervals of time; also the timing of the remittances is frequently chosen to insure favorable exchange rates.[40] (2) Consider the exchange adjustment account to be a "deferred" item (debit or credit) which should be carried forward from one fiscal period to another on the balance sheet. If at any given balance sheet date there is a net credit "carry-over," it is usually presented on the balance sheet as a Reserve for Exchange Fluctuation or as a Reserve for Unrealized Profit in Foreign Exchange. (These account titles, in the opinion of the authors, should be shown under the caption "Deferred Credits"; they may, however,

[38] Lopata, 61 *Journal of Accountancy* 125; see also (1948) annual report of Standard Oil Company (New Jersey) — in this report there was a gain of $616,900 in 1947 and a loss of $5,527,440 in 1948.

[39] O.D. 550, II C.B. 61; O.D. 618, III C.B. 334; *Victor v. Salt's*, 26 Fed. (2nd) 249.

[40] The tax treatment for foreign subsidiaries is not the same as for foreign branches. See *Louis Roessel and Co., Ltd.*, 2 B.T.A. 1141.

be shown under Proprietorship.[41]) If, on the other hand, at any given balance sheet date there is a net debit "carry-over," it may be presented on the balance sheet as a deferred charge item. This technique is consistent in that both debit and credit exchange adjustments are carried forward under the theory that over a period of years they will approximate each other. In spite of this, on the grounds of conservatism, it is rather widely recommended that the credit balances be carried forward (see below), but many authorities do not sanction the carrying forward of a debit balance.[42]
(3) Consider the exchange adjustment amount (if a debit for any particular year-end) as a loss chargeable to the Branch Profit and Loss account, but if a credit results from the conversion of the branch trial balance, carry forward the amount as a Reserve for Exchange Fluctuations. This treatment is regarded as the most conservative and is supported by such statements as these: "If there is a gain on exchange it should be carried to a reserve for exchange fluctuations (unless the amount is relatively small). . . . If there is a loss on exchange it should be deducted on the profit and loss statement just before computing the net profits for the year." [43] The Reserve for Exchange Fluctuations set up at the end of any certain fiscal year would supposedly be charged in future years for debits arising from exchange losses.[44]

It should be observed that some accountants advocate the creation of earned surplus appropriated reserves for the amount of the exchange adjustments (if it is a debit figure). Other accountants recommend the setting up of reserves (by means of charges to periodic revenues) for amounts in excess of the "balancing" figure necessary for the converted trial balance, especially if there is considerable uncertainty about the foreign operations.

In addition to the discussion above the student should note the following excerpt quoted by permission from a statement by the Committee on Accounting Procedure of the American Institute of Accountants (*Research Bulletin No. 4*):

7. Realized losses or gains on foreign exchange should be charged against or credited to operations.

Provision for declines in conversion value of foreign net current and working assets should be made and shown separately.

In considering whether such a provision should or should not be deducted in arriving at the amount of net income for the year from which the net income per share is ordinarily computed, it must not be overlooked that if the amount of the provision is relatively large, the balance shown before making the deduction, the deduction itself, and the balance after making the deduction are all significant.

[41] (1946) Fjeld-Sherritt 108; (1938) Taylor-Miller 311. On the 1948 annual report of The Texas Company the title is shown under a heading called "Reserves."
[42] (1946) Finney, II, 430; (1946) Fjeld-Sherritt 102, 108.
[43] (1935) Baumann-Gordon 158; see also (1946) Finney, II, 430.
[44] (1946) Fjeld-Sherritt 108.

It is desirable that investors should consider the component elements of net income and surplus changes and should be given reasonable information to enable them to do so, and that they should not be encouraged to attach undue importance to a single figure.

Where a corporation publishes a continuous statement of income and surplus, the situation can be met by showing the income before and after the deduction of the provision and refraining from describing either figure as "Net Income for the Year" without amplification of the expression.

Where the corporation's practice is to carry the balance of income to a separate surplus statement, either (1) the provision should appear as a charge in the income statement, the balance before and after the charge perhaps being shown, or (2) if the amount and the circumstances are such that this would seriously impair the value of the income statement as an indication of earning capacity, and the charge for that reason is made to surplus, a clear disclosure of the treatment should appear in a note to the income statement.

**Income tax questions arising from foreign transactions.**[45] The important income tax problems which arise in connection with foreign branches and subsidiaries may be summarized as follows:

1. Except for dealers in foreign exchange, no tax loss or gain can be reported on foreign currencies until such currencies are used (a) to purchase some asset classifiable as a "capital asset," (b) to trade for personal services to be rendered the taxpayer, or (c) to convert the foreign money into domestic currency. A dealer may of course inventory the foreign currency and by the adoption of the lower of cost or market rule receive an immediate end-of-the-tax-period benefit.[46]

2. For income realized in a foreign country and for the proceeds from capital transactions, there is no tax due in the United States until the money from the transactions is moved (or could be moved) to this country. (This rule is subject to an exception, however, in the event the United States taxpayer makes outlays in the foreign country from the realized foreign income,[47] such as retirement of a debt.)

3. In some instances, where the foreign exchange is blocked, formal application to the proper officials must be made to secure the transfer of even a portion of the funds held in the other country. If such an application is pending at the end of the taxable year, there may be some question as to whether the mere application is sufficient to allow the income to be taxed in the year of application rather than in the year of actual transfer. The decision in this case must rest on the evidence as to whether the application is simply a formality or whether there may still be grave doubt as to the eventual actuality of the transfer of funds.

4. Since some foreign exchange rates fluctuate a great deal during even

[45] Angel-Kramer, 88 *Journal of Accountancy* 502.
[46] *Haviland v. Edwards*, 20 Fed. (2nd) 905.
[47] *Credit and Investment Corp.*, 47 B.T.A. 872

one year, the question as to which rate applies in the determination of United States income arises. Ordinarily, the effective free market rate as of the time of the transfer of funds is the one which must be used. In the event, however, that the funds are transferable, but are not actually transferred because of the desire of the taxpayer, the highest free market rate effective during the time the income could have been transferred is the one which must be used in determining the United States income.[48] In the case of bank accounts in other countries in which funds have been deposited at varying rates, the withdrawals are commonly handled on the first-in, first-out rule in the absence of positive identification.[49]

**Foreign subsidiaries.** In many cases foreign branches may be separately incorporated under the laws of the foreign country. Where such is the case and the entire capital of the subsidiary is supplied by the parent concern, the entries for the organization of the subsidiary would be as follows:

| Parent Company | | | Foreign Subsidiary | | |
|---|---|---|---|---|---|
| Investment in Liverpool Company. | $370,000 | | Cash . . . . . | £100,000 | |
| Cash . . . . . | | $370,000 | Capital Stock . . | | £100,000 |
| (Exchange rate 3.70) | | | (Original investment) | | |

This investment account may be carried on the books in the same way as the investment in a domestic subsidiary. If the Investment account is to be adjusted periodically, entries are made debiting the Investment account with the parent company's share of the profit of the subsidiary and crediting it with the parent company's share of losses and dividends. In consolidating the balance sheets of the two companies, the subsidiary's Capital Stock account is converted at the actual dollar cash paid for the stock by the parent, and the subsidiary's Earned Surplus account is arbitrarily converted at a figure which will balance the subsidiary's balance sheet after all other accounts are converted into dollars. If the parent company's Investment account does not agree with the total of the subsidiary's Capital Stock and Earned Surplus (or the parent company's proportionate claim against such accounts where there is not a 100 per cent ownership) after the conversion, an adjusting entry to the Investment account (with an offsetting debit or credit to Profit and Loss or to Reserve for Exchange) is made to bring about the desired agreement.

Shipments made by the parent company to the subsidiary may be handled in the same way as that described for branches. The parent company debits a Current account and credits Sales to Foreign Subsidiary; the subsidiary debits Purchases and credits Home Office Current. The

[48] *International Mortgage and Investment Corporation*, 36 B.T.A. 187.
[49] Regulations 111, Section 29.22(a)–8.

Sales to Foreign Subsidiary account, where there is 100 per cent ownership by the parent, is handled in the same way as the Shipments to Branches. If there is not 100 per cent ownership, the Sales to Foreign Subsidiary account is treated as a regular sales account.

**Consolidation of statements of foreign subsidiary and parent company.** The consolidation of the statements of the foreign subsidiary with those of the parent company is accomplished in the same manner as that described for the domestic subsidiary and holding company after the trial balance of the foreign subsidiary is stated in domestic currency. The conversion is accomplished in the same manner and by the use of the same principles of conversion as described for foreign branches.

To illustrate the accounting procedures involved, the following problem, adapted from an American Institute of Accountants examination, is given. The inventory in the solution to this problem is converted according to the English rule of the dollar cost to the parent instead of at the current rate of exchange. The English rule of conversion appears to be much better in this instance because the use of the high rate current at the end of the period would result in the taking up of substantial unrealized income. Too, the high current rate may be out of line because of temporary market conditions. The rate current at the end of the year is, in this case, higher than any other rate obtaining during the year.

### *Illustrative Problem*

The Arlington Silk Mills incorporated a selling company in Europe, as of January 1, 19—, to take over the assets and liabilities of their European office at that date, which were as follows:

| Assets | Francs | Liabilities and Capital | Francs |
|---|---|---|---|
| Cash | 134,000 | Accounts Payable | 23,800 |
| Accounts Receivable (net) | 680,000 | Arlington Silk Mills, Current | 1,780,200 |
| Merchandise at Home Office Cost, plus Freight Charges | 1,050,000 | Capital Stock | 100,000 |
| Furniture and Fixtures (net) | 40,000 | | |
| | 1,904,000 | | 1,904,000 |

During the year, merchandise costing $160,000 was shipped by the Arlington Silk Mills and billed at 10 per cent above cost, as follows:

| | Dollars | Rate | Francs |
|---|---|---|---|
| January 16 | 30,000 | .0373 | 804,289.55 |
| March 27 | 20,000 | .0342 | 584,795.32 |
| May 6 | 50,000 | .0324 | 1,543,209.88 |
| August 14 | 40,000 | .0275 | 1,454,545.45 |
| October 16 | 36,000 | .0286 | 1,258,741.26 |
| | 176,000 | | 5,645,581.46 |

The European company converted the invoiced prices at the rate prevailing at the date of shipment and priced the goods sold on the first-in, first-out principle. The inventory at the end of the year amounted to 1,412,000 francs, which included freight charges of 140,000 francs. The European company remitted as follows:

| | Francs | Rate | Dollars |
|---|---|---|---|
| February 20 | 500,000 | .0356 | 17,800 |
| June 12 | 1,000,000 | .0287 | 28,700 |
| July 10 | 800,000 | .0254 | 20,320 |
| August 28 | 1,000,000 | .0284 | 28,400 |
| November 27 | 700,000 | .0360 | 25,200 |
| December 12 | 1,000,000 | .0379 | 37,900 |
| | 5,000,000 | | 158,320 |

The exchange rates were 3.70 cents and 3.90 cents to the franc on January 1 and December 31, respectively.

**EUROPEAN COMPANY**
**Trial Balance**
December 31, 19—

| | Francs | | Francs |
|---|---|---|---|
| Merchandise Purchased | 5,645,581.46 | Sales | 7,730,000.00 |
| Merchandise Inventory | 1,050,000.00 | Accounts Payable | 73,800.00 |
| Freight Charges | 580,000.00 | Arlington Silk Mills | 2,425,781.46 |
| Warehouse Charges | 213,000.00 | Capital Stock | 100,000.00 |
| Salaries | 474,000.00 | | |
| General Expenses | 306,000.00 | | |
| Selling Expenses | 117,000.00 | | |
| Accounts Receivable (net) | 1,610,000.00 | | |
| Cash | 284,000.00 | | |
| Furniture and Fixtures | 50,000.00 | | |
| | 10,329,581.46 | | 10,329,581.46 |

Prepare a work sheet showing the converted trial balance, balance sheet, and Profit and Loss account of the European company. Submit the journal entries on the books of the home office preparatory to making consolidated statements and the elimination entries on the consolidated balance sheet working papers if the home company had paid $3,700 for the stock of the European company on January 1.

*Solution*

The eleven exchange rates given for the shipments and remittances were timed to give a good average rate for the year; the eleven add to .3520 and have an average of .0320, which should be used in converting all the nominal accounts except the initial inventory (converted at January 1 rate of .037) and the merchandise purchased from the home office (converted at dollar cost — $176,000). The current assets, other than inventory, and current liabilities, other than home office current, should be converted at the current rate of exchange (.039).

The furniture and fixtures on hand on January 1 should be converted at the January 1 rate (.037) and the additions at the average rate for the year (.032) as no dates of purchases or rates were given for them.

The Arlington Silk Mills account should be converted at the dollar cost, as follows:

| | Francs | | Dollars |
|---|---|---|---|
| Balance, January 1 | 1,780,200.00 | (at .037) | 65,867.40 |
| Merchandise Shipments | 5,645,581.46 | (at dollar cost) | 176,000.00 |
| | 7,425,781.46 | | 241,867.40 |
| Remittances | 5,000,000.00 | (at dollar value) | 158,320.00 |
| Balance, December 31 | 2,425,781.46 | | 83,547.40 |

As the exchange rates have risen since the last shipments of merchandise, the English rule for converting merchandise should be applied. The final inventory should be identified as to shipments and converted at the rates prevailing when each shipment was made, as follows:

| | Francs | | Dollars |
|---|---|---|---|
| Inventory and Freight as Given | 1,412,000.00 | | |
| Freight Charges | 140,000.00 | (at .032) | 4,480.00 |
| Merchandise from Home Office | 1,272,000.00 | | |
| Entire October 16 Shipment | 1,258,741.26 | (at .0286) | 36,000.00 |
| Part of August 14 Shipment | 13,258.74 | (at .0275) | 364.62 |
| Dollar Value | | | 40,844.62 |

The beginning Inventory and Capital Stock accounts should be converted at the rate prevailing when they were acquired (.037).

## THE EUROPEAN COMPANY

### Working Sheet

December 31, 19—

| | Unconverted Trial Balance | Conversion Rate | Converted: Trial Balance | Converted: Profit and Loss | Converted: Balance Sheet |
|---|---|---|---|---|---|
| Merchandise Purchased | Fcs. 5,645,581.46 | (a) | $176,000.00 | $176,000.00 | ..... |
| Inventory, Jan. 1 | 1,050,000.00 | .037 | 38,850.00 | 38,850.00 | ..... |
| Freight Charges | 580,000.00 | .032 | 18,560.00 | 18,560.00 | ..... |
| Warehouse Charges | 213,000.00 | .032 | 6,816.00 | 6,816.00 | ..... |
| Salaries | 474,000.00 | .032 | 15,168.00 | 15,168.00 | ..... |
| General Expense | 306,000.00 | .032 | 9,792.00 | 9,792.00 | ..... |
| Selling Expense | 117,000.00 | .032 | 3,744.00 | 3,744.00 | ..... |
| Accounts Receivable | 1,610,000.00 | .039 | 62,790.00 | ..... | $ 62,790.00 |
| Cash | 284,000.00 | .039 | 11,076.00 | ..... | 11,076.00 |
| Furniture and Fixtures: | | | | | |
| Initial Balance | 40,000.00 | .037 | 1,480.00 | ..... | 1,480.00 |
| Additions | 10,000.00 | .032 | 320.00 | ..... | 320.00 |
| | Fcs. 10,329,581.46 | | | | |
| Final Inventory | Fcs. 1,412,000.00 | (a) | ..... | ..... | 40,844.62 |
| Income | ..... | ... | ..... | 19,274.62 | ..... |
| | | | $344,596.00 | $288,204.62 | $116,510 62 |
| Sales | Fcs. 7,730,000.00 | .032 | $247,360.00 | $247,360.00 | ..... |
| Accounts Payable | 73,800.00 | .039 | 2,878.20 | ..... | $ 2,878.20 |
| Arlington Silk Mills | 2,425,781.46 | (a) | 83,547.40 | ..... | 83,547.40 |
| Capital Stock | 100,000.00 | .037 | 3,700.00 | ..... | 3,700.00 |
| | Fcs. 10,329,581.46 | | | | |
| Final Inventory | Fcs. 1,412,000.00 | (a) | ..... | 40,844.62 | ..... |
| Reserve for Exchange Fluctuations | ..... | .... | 7,110.40 | ..... | 7,110.40 |
| Income | ..... | .... | ..... | ..... | 19,274.62 |
| | | | $344,596.00 | $288,204.62 | $116,510.62 |

(a) Specially converted.

**Home Office Journal Entries**

| | | |
|---|---|---|
| Investment in European Company | $26,385.02 | |
| Earned Surplus (or Profit and Loss) | | $19,274.62 |
| Reserve for Exchange Fluctuations | | 7,110.40 |
| To take up the profits of subsidiary. | | |

**Elimination Entries on Consolidated Balance Sheet Working Papers**

The computation of the balance of and the entry for the Reserve for Unrealized Intercompany Profit in European Company's Inventory is as follows:

| | |
|---|---|
| Inventory and Freight as in European Company's Balance Sheet | $40,844.62 |
| Freight Therein (140,000 Francs at .032) | 4,480.00 |
| Merchandise Invoiced at 110 per cent of Cost | $36,364.62 |
| Merchandise at Cost ($36,364.62 × 10/11) | 33,058.75 |
| Correct Balance to Reserve for Unrealized Intercompany Profit | $ 3,305.87 |

| | | |
|---|---|---|
| Earned Surplus (or Profit and Loss) | $ 3,305.87 | |
| Reserve for Unrealized Intercompany Profit in European Company's Inventory | | $ 3,305.87 |

The elimination entry for the stock holdings (carried at actual value) is:

| | | |
|---|---|---|
| Capital Stock (on European Company's books) | $ 3,700.00 | |
| Earned Surplus (on European Company's books) | 19,274.62 | |
| Reserve for Exchange Fluctuations (on European Company's books) | 7,110.40 | |
| Investment in European Company (on parent's books) | | $30,085.02 |

The elimination entry for the current accounts is:

| | | |
|---|---|---|
| Arlington Silk Mills — Current | $83,547.40 | |
| Due from European Company | | $83,547.40 |

**English subsidiary.** The following problem, adapted from an American Institute of Accountants examination, illustrates some refinements in the accounting for depreciation and inventories; the conversion of the Earned Surplus account by the "forcing a balance" method is especially interesting as a surplus in pounds becomes a deficit in dollars.

***Illustrative Problem***

Prepare consolidated working papers of the Goodenough Corporation and its fully owned foreign subsidiary.

**THE BRITISH GOODENOUGH COMPANY, LTD.**
**Balance Sheet as of December 31, 19—**

LIABILITIES

| | | |
|---|---|---|
| Share Capital: | | |
| Authorized: | | |
| 600,000 Shares of £1 each | £600,000 | |
| Issued: | | |
| 600,000 Shares of £1 each | | £600,000 |
| Current Trade Liabilities | | 78,500 |
| Reserve for Income Tax Payable | | 164,500 |
| Indebtedness to Affiliated Company | | 2,500 |
| Profit and Loss Appropriation Account: | | |
| Balance, January 1 | £ 12,145 | |
| Income for Year | 298,000 | |
| | £310,145 | |
| Less: Dividends | 200,000 | 110,145 |
| | | £955,645 |

ASSETS

| | | |
|---|---|---|
| Property, Plant and Equipment at Cost | £700,000 | |
| Less: Reserve for Depreciation | 250,000 | £450,000 |
| Stock on Hand at Cost | | 170,000 |
| Customers' Accounts Receivable | £260,380 | |
| Less: Reserve for Bad and Doubtful Accounts | 10,000 | 250,380 |
| Cash on Hand and in Bank | | 85,265 |
| | | £955,645 |

AUDITORS' NOTES

1. With the exception of machinery costing £100,000, which was installed in November when the average rate of exchange was 3.50, the property, plant, and equipment were acquired when the company was formed, when the rate of exchange was at old par (4.86). The established policy of the company is to charge a full year's depreciation on additions made in the first six months of any year and to charge depreciation commencing January 1 of the year following the year of addition on additions made in the second six months of any year.

2. Of the stock on hand, £160,000 represents goods purchased from the Goodenough Corporation, the parent company, at a cost of $540,000 plus freight to England of $36,000 paid by the parent company at the time of shipment. Cost of the remaining £10,000 of British goods approximated market on December 31. There had been no change in freight rates to December 31, and the rate of exchange on that date was 3.40. The Goodenough Corporation has reduced the cost of its inventory by 10 per cent in order to reflect the lower of cost or market value as of December 31. (The directors have agreed that for the purpose of the consolidated balance sheet the inventory as a whole should be valued at the lower of cost or market value.)

**THE GOODENOUGH CORPORATION**
**Post-Closing Trial Balance as of December 31, 19—**

| | | |
|---|---|---|
| Cash in Banks and on Hand | $ 880,000 | |
| Accounts Receivable | 2,414,000 | |
| Reserve for Doubtful Accounts | | $ 210,000 |
| Inventories | 1,325,000 | |
| Property, Plant and Equipment | 6,875,000 | |
| Reserve for Depreciation | | 2,500,000 |
| Due from the British Goodenough Co., Ltd. | 10,000 | |
| Accounts Payable | | 2,820,000 |
| Provision for Federal Income Tax | | 275,000 |
| Capital Stock — Common, No-par, Authorized and Issued | | 5,000,000 |
| Surplus (Earned) | | 3,615,000 |
| Investment in Subsidiary Company at Cost | 2,916,000 | |
| | $14,420,000 | $14,420,000 |

AUDITORS' NOTES

1. The intercompany account is debited or credited at the actual rate of exchange on the date of each transaction, but the balance at the end of each month is adjusted on the books of the parent company by a debit or a credit to the Profit and Loss account, to bring the account to the basis of a fixed rate of exchange, viz., $4. The actual dollar cost of the £2,500 shown on the British company's balance sheet was $9,520. There were no items in transit.
2. The subsidiary's stock was purchased when the company was organized.

*Solution*

The fixed assets acquired since affiliation should be converted at the rate prevailing when the assets were purchased; the average rate prevailing during the period (3.50) is a reasonable substitute.

The British company's inventory should be analyzed and adjusted as follows:

| | Unadjusted | 10 Per Cent Reduction | Adjusted |
|---|---|---|---|
| Imported from U.S.: | | | |
| Invoice Cost | £150,000 a | £15,000 b | £135,000 |
| Freight | 10,000 | | 10,000 |
| British Goods | 10,000 | | 10,000 |
| | £170,000 | | £155,000 |

a. 540/576 × £160,000 = £150,000.
b. To reduce to market which is 10 per cent lower than cost.

Both classes of merchandise should be converted at the current rate of exchange (3.40) along with all the other current assets (and their related reserve) and the current liabilities, except the parent's current account, which should be converted at its actual dollar cost. Note that the exchange rate has declined since the merchandise was purchased from the parent company.

The capital stock should be converted at the rate prevailing at the date it was purchased by the holding company (4.86).

Since no depreciation was charged on the November additions, the 4.86 rate, which was used to convert the old fixed assets, should be used to convert the Reserve for Depreciation account.

Enough dollars should be assigned to the Earned Surplus (Profit and Loss Appropriation) account to make the British company's statement balance after conversion (a deficit of $32,257 in this case).

**THE BRITISH GOODENOUGH COMPANY, LTD.**
**Statement of Balance Sheet Conversion**

December 31, 19—

| | Pounds | Rate | Dollars |
|---|---|---|---|
| ASSETS | | | |
| Property, Plant and Equipment: | | | |
| Old Balance | 600,000 | 4.86 | 2,916,000 |
| Additions | 100,000 | 3.50 | 350,000 |
| Stock on Hand: | | | |
| American Goods: | | | |
| Invoice Price | 135,000 a | 3.40 | 459,000 |
| Freight | 10,000 | 3.40 | 34,000 |
| British Goods | 10,000 | 3.40 | 34,000 |
| Customers' Accounts Receivable | 260,380 | 3.40 | 885,292 |
| Cash on Hand and in Bank | 85,265 | 3.40 | 289,901 |
| | 1,200,645 | | 4,968,193 |
| LIABILITIES AND PROPRIETORSHIP | | | |
| Current Trade Liabilities | 78,500 | 3.40 | 266,900 |
| Reserve for Income Tax Payable | 164,500 | 3.40 | 559,300 |
| Indebtedness to Affiliated Company | 2,500 | | 9,250 |
| Reserve for Depreciation | 250,000 | 4.86 | 1,215,000 |
| Reserve for Bad and Doubtful Accounts | 10,000 | 3.40 | 34,000 |
| Profit and Loss Appropriation Account | 95,145 a | | 32,257* |
| Share Capital (600,000 Shares of £1 each) | 600,000 | 4.86 | 2,916,000 |
| | 1,200,645 | | 4,968,193 |

a. After writing inventory down £15,000.
* Deficit.

The current accounts of the parent and subsidiary companies reconcile in foreign currency (£2,500). The parent company's idea of carrying the account at a fixed rate of exchange, while commonly practiced in years past, cannot be accepted in a period of fluctuating exchange rates. The carrying value of the subsidiary's account current should be its dollar value ($9,250); this calls for a $750 adjustment.

The parent may carry the subsidiary's stock at cost if it eliminates only the par value of the stock purchased (stock acquired at par when there was neither a surplus nor a deficit). If the actual value method of preparing consolidated balance sheets is to be employed, the parent must take up the entire deficit of the subsidiary. The parent's adjusting entry would be:

| | | |
|---|---|---|
| Earned Surplus (or Profit and Loss) | $33,007 | |
| Due from the British Goodenough Co., Ltd. | | $ 750 |
| Investment in Subsidiary Company | | 32,257 |

**THE GOODENOUGH CORPORATION**
**Consolidated Balance Sheet Working Papers**
December 31, 19—

| | Parent | Subsidiary | Eliminations | C. B. S. |
|---|---|---|---|---|
| Cash in Banks and on Hand | $ 880,000 | $ 289,901 | ..... | $ 1,169,901 |
| Accounts Receivable | 2,414,000 | 885,292 | ..... | 3,299,292 |
| Inventories | 1,325,000 | 527,000 | ..... | 1,852,000 |
| Property, Plant, and Equipment | 6,875,000 | 3,266,000 | ..... | 10,141,000 |
| Due from Subsidiary | 9,250 | ..... | A$ 9,250 | ..... |
| Investment in Subsidiary | 2,883,743 | ..... | B 2,883,743 | ..... |
| | $14,386,993 | $4,968,193 | ..... | $16,462,193 |
| Reserve for Bad and Doubtful Accounts | $ 210,000 | $ 34,000 | ..... | $ 244,000 |
| Reserve for Depreciation | 2,500,000 | 1,215,000 | ..... | 3,715,000 |
| Accounts Payable | 2,820,000 | 266,900 | ..... | 3,086,900 |
| Indebtedness to Affiliated Co. | ..... | 9,250 | A 9,250 | ..... |
| Provision for Income Taxes | 275,000 | 559,300 | ..... | 834,300 |
| Capital Stock: | | | | |
| Goodenough Company | 5,000,000 | ..... | ..... | 5,000,000 |
| British Goodenough Company. | ..... | 2,916,000 | B 2,916,000 | ..... |
| Earned Surplus or Deficit*: | | | | |
| Goodenough Company | 3,581,993 | ..... | ..... | 3,581,993 |
| British Goodenough Company. | ..... | 32,257* | B 32,257* | ..... |
| | $14,386,993 | $4,968,193 | ..... | $16,462,193 |

**Canadian subsidiary.** The following problem, adapted from an American Institute of Accountants examination, illustrates the necessity of being able to recognize the principles of foreign exchange even when appearing in disguise. The "nominal" dollar of the problem is used to describe account balances containing entries in both Canadian and United States dollars. Obviously, all account balances must be analyzed and restated in terms of United States currency before consolidation. The problem contains some nice applications of the theories of conversion.

*Illustrative Problem*

The Products Company, Ltd., Canada, keeps its records on a nominal dollar basis, and presents the following balance sheet as of December 31, 19—:

| Assets | | Liabilities and Proprietorship | | |
|---|---|---|---|---|
| Cash | $ 10,000 | Notes Payable | | $ 15,000 |
| Accounts Receivable | 300,000 | Accounts Payable | | 150,000 |
| Inventories | 250,000 | Due to Parent Co. (U.S. dollars) | | 200,000 |
| Fixed Assets (U.S. dollar cost at date of acquisition) | 100,000 | Capital Stock | | 150,000 |
| | | Earned Surplus: | | |
| | | Beginning of Year | $ 25,000 | |
| | | Profit for Year | 120,000 | 145,000 |
| | $660,000 | | | $660,000 |

The following information is available:

Accounts Receivable — all Canadian funds.
Notes Payable — all Canadian funds.
Accounts Payable — $30,000 payable in Canadian funds and $120,000 in United States funds.
Inventories:

| | |
|---|---|
| Raw Materials Purchased in Canadian Funds | $ 20,000 |
| Raw Materials Purchased in United States Funds | 105,000 |
| Goods in Process | 125,000 |

This item includes material purchased both in United States and Canada, with labor all performed in Canada. The total purchases for the year average, approximately, 85 per cent from United States and 15 per cent in Canada. The labor cost approximates 25 per cent of the cost of the materials.

The Investment in the Products Company, Ltd. account on the parent's books has not been changed for a year. Kept according to the actual value method, it may be analyzed as follows:

| | |
|---|---|
| Purchase Price for Stock at Par when Canadian Dollars Were at Par | $150,000 |
| Profits since Acquisition not Received as Dividends | 17,500 |
| Total Carrying Value on January 1, 19— | $167,500 |

The Products Company's inventory involved no intercompany profits on materials purchased from the parent.

You are requested to prepare a balance sheet in United States currency for consolidation with the parent company's balance sheet assuming a Canadian dollar to be worth 80 cents.

*Solution*

**THE PRODUCTS COMPANY, LTD.**
**Conversion Balance Sheet**
December 31, 19—

| | Nominal Dollar Basis | Conversion Rate | U.S. Dollar Basis |
|---|---|---|---|
| ASSETS | | | |
| Cash | $ 10,000 | $ .80 | $ 8,000 |
| Accounts Receivable | 300,000 | .80 | 240,000 |
| Inventories: | | | |
| Raw Materials: | | | |
| Purchased in Canadian Funds | 20,000 | .80 | 16,000 |
| Purchased in U.S. Funds | 105,000 | 1.00 | 105,000 |
| Goods in Process: | | | |
| Labor (25/125 × $125,000) | 25,000 | .80 | 20,000 |
| Raw Materials: | | | |
| Purchased in Canadian Funds | 15,000 | .80 | 12,000 |
| Purchased in U.S. Funds | 85,000 | 1.00 | 85,000 |
| Fixed Assets | 100,000 | 1.00 | 100,000 |
| | $660,000 | | $586,000 |

| | Nominal Dollar Basis | Conversion Rate | U.S. Dollar Basis |
|---|---|---|---|
| LIABILITIES AND PROPRIETORSHIP | | | |
| Notes Payable | $ 15,000 | .80 | $ 12,000 |
| Accounts Payable: | | | |
| In Canadian Funds | 30,000 | .80 | 24,000 |
| In U.S. Funds | 120,000 | 1.00 | 120,000 |
| Due to Parent Company | 200,000 | 1.00 | 200,000 |
| Capital Stock | 150,000 | 1.00 | 150,000 |
| Earned Surplus — Beginning of Year | 25,000 | | 17,500 |
| Profit for Year | 120,000 | | 62,500 |
| | $660,000 | | $586,000 |

In order to study the above solution, assume a balance sheet as of the date of acquiring control of the Canadian company (exchange rate par), and a balance sheet as of January 1 which had capital stock of $150,000 and earned surplus of $25,000 on a nominal dollar basis and proprietorship of $167,500 on a converted basis. Assume further that the exchange rate dropped from par to 80 cents on January 2 and remained constant during the current year.

| | At Purchase of Stock | January 1 (Unconverted) | Rate | January 1 (Converted) |
|---|---|---|---|---|
| Cash | $ 50,000 | $ 10,000 | $ .90 | $ 9,000 |
| Accounts Receivable | ..... | 80,000 | .90 | 72,000 |
| Fixed Assets | 100,000 | 100,000 | 1.00 | 100,000 |
| | $150,000 | $190,000 | | $181,000 |
| Notes Payable | ..... | $ 15,000 | .90 | $ 13,500 |
| Capital Stock | $150,000 | 150,000 | 1.00 | 150,000 |
| Earned Surplus | ..... | 25,000 | | 17,500 |
| | $150,000 | $190,000 | | $181,000 |
| Account on parent's books: | | | | |
| Investment in Products Company | $150,000 | ..... | | $167,500 |

If the Canadian company records transactions involving United States currency in Canadian dollars (the normal procedure), the compound entry for the current year would be:

| | | |
|---|---|---|
| Accounts Receivable | $220,000 | |
| Raw Materials: | | |
| Canadian | 20,000 | |
| United States | 131,250 | |
| Goods in Process: | | |
| Labor | 25,000 | |
| Raw Materials (Canadian) | 15,000 | |
| Raw Materials (United States) | 106,250 | |
| Accounts Payable (Canadian) | | $ 30,000 |
| Accounts Payable (United States) | | 150,000 |
| Due to Parent Company | | 250,000 |
| Profit and Loss | | 87,500 |

The profit on a nominal dollar basis of $120,000 can be reconciled with the $87,500 profit on a Canadian dollar basis as follows:

| | | |
|---|---|---|
| Liabilities undervalued on nominal dollar basis: | | |
| Accounts Payable | $120,000 | |
| Due to Parent Company | 200,000 | $320,000 |
| Assets undervalued on nominal dollar basis: | | |
| Raw Materials | $105,000 | |
| Goods in Process | 85,000 | 190,000 |
| Net Liabilities undervalued 25 per cent. | | $130,000 |
| Nominal Profit | | $120,000 |
| Undervaluation of Liabilities (.25 × $130,000) | | 32,500 |
| Corrected Profit | | $ 87,500 |

Posting the foregoing journal entry to the unconverted January 1 balance sheet given above results in the following trial balances:

| | December 31 (Unconverted) | Rate | December 31 (Converted) |
|---|---|---|---|
| ASSETS | | | |
| Cash | $ 10,000 | $ .80 | $ 8,000 |
| Accounts Receivable | 300,000 | .80 | 240,000 |
| Raw Materials: | | | |
| Canadian | 20,000 | .80 | 16,000 |
| United States | 131,250 | (b) | 105,000 |
| Goods in Process: | | | |
| Labor (Canadian) | 25,000 | .80 | 20,000 |
| Raw Materials (Canadian) | 15,000 | .80 | 12,000 |
| Raw Materials (United States) | 106,250 | (b) | 85,000 |
| Fixed Assets | 100,000 | 1.00 | 100,000 |
| | $707,500 | | $586,000 |
| LIABILITIES AND PROPRIETORSHIP | | | |
| Notes Payable | $ 15,000 | .80 | $ 12,000 |
| Accounts Payable (Canadian) | 30,000 | .80 | 24,000 |
| Accounts Payable (United States) | 150,000 | .80 | 120,000 |
| Due to Parent Company | 250,000 | (a) | 200,000 |
| Capital Stock | 150,000 | 1.00 | 150,000 |
| Surplus (Earned) | 25,000 | (a) | 17,500 |
| Profit for Year | 87,500 | (c) | 62,500 |
| | $707,500 | | $586,000 |

(a) Converted at United States dollar balance on parent company's books.
(b) Converted at United States dollar valued in memorandum columns of subsidiary's books.
(c) Converted at amount needed to make last column balance.

# CHAPTER 16

## Stabilized Accounting

**Origin of stabilized accounting.** As is well known, World War I in Europe was followed by a period of inflation, especially in Germany and France. The purchasing power of the monetary units decreased at a rapid pace and it was soon apparent that regular accounting procedures as applied to business data gave unsatisfactory and even deceptive results. The effect of inflation upon the usefulness of accounting statements may be summarized as follows:[1]

1. The book figures are not representative of the same real monetary unit that they apparently express.
2. Calculation of income results in an absurd figure.
3. The real economic capital of the business is not maintained.
4. The value equivalence of the proprietorship tends to decrease, entangled as it is in the maelstrom of gyrating prices, false profits, and the feverish consumption of capital.
5. There is a good possibility that dividends will be paid from the economic capital of the enterprise, since the decision to pay dividends may be based on misleading income figures.
6. Taxes on income are likewise often paid from economic capital.

While the effects of inflation were most serious in Germany, deficiencies in French accounting also appeared.[2] In both of these countries, accountants had very few precedents upon which to build a more useful type of accounting methodology. They had to develop, therefore, their own techniques. One suggested alternate method was found to be impracticable. It was based on the plan of converting all the business data and transactions into some relatively more stable monetary unit, such as the United States dollar. This method proved to be unusually troublesome, and, in addition, there was still considerable fluctuation in all of the currencies of the time. Moreover, the use of the domestic monetary unit could not be entirely abandoned, since it was retained by the government as legal tender. Statutes were also enacted, at least in Germany, which required business firms to draw up a balance sheet at least once each year with imperial marks as the unit used in the money columns of the statement.

In view of the defects and disadvantages inherent in the plan outlined above, it became common practice in the countries which suffered most from

[1] Adapted from Sweeney, 43 *Journal of Accountancy* 183–191; Sweeney, 45 *Journal of Accountancy* 104; see also Spear, 24 *Accounting Review* 369; Weston, 24 *Accounting Review* 379; Mackenzie, 24 *Accounting Review* 360; Graham, 24 *Accounting Review* 15.

[2] Wasserman, 6 *Accounting Review* 1–32; Wasserman, 9 *Accounting Review* 130–139.

inflation to stabilize the balance sheet in terms of the monetary unit expressed in gold equivalent. In this way, an attempt was made to price all the business assets and liabilities on a comparable purchasing power basis; this also had the desired effect of expressing the proprietorship of the firm at a figure which would be helpful in determining whether the economic capital was being maintained. The effects of dividends and taxes could also be more effectively appraised. While the technique employed varied somewhat in the different countries, it was based essentially on a plan of converting final end-of-period book balances to the equivalent stabilized figures. While an example of the details associated with this plan is given in a later section of this chapter, it should be noted here that this is a much simpler arrangement than the one employing a foreign currency unit. Considerable comparability is also secured along with a saving of time; the latter is partially due to the fact that property accounts and their related reserves have to be stabilized only once, except for additions, disposals, or replacements.

In the light (1) of the inflationary conditions which caused regular accounting procedures and postulates to become outmoded in the European countries and (2) of the fact that the United States dollar has a constantly varying purchasing power, an American accountant, H. W. Sweeney, developed in the early 1930's a complete and thorough methodology for adjusting the financial statements in periods of rapidly changing price movements.[3] The name "stabilized accounting" was soon associated with Sweeney's technique. While the basic pattern of the method had been drawn by European accountants, it remained for Sweeney to fill in wide gaps in the details of the procedure. He believes that stabilized accounting offers many advantages in periods of inflation or deflation. A brief definition of the technique is: "Stabilized accounting is the planned application of index numbers to orthodox accounting records in order to reflect changes in value brought about by fluctuations in the purchasing power of the dollar." [4]

Before giving an illustration of stabilized accounting, some further discussion of its fundamental tenets is necessary. Several matters of interest are treated therefore in succeeding sections.[5]

**Effects of inflation on the balance sheet.** It is a commonplace postulate of accounting to state that the accounts are always prepared in a unit involving money. So long as this monetary unit continues to have approximately the same purchasing power (goods and services) the unit continues as a satisfactory medium for expressing the financial affairs of a business

[3] (1936) Sweeney (entire book).
[4] Dulan, 10 *The Texas Accountant* 4.
[5] See Sweeney articles in *Accounting Review:* 5, 277–287; 6, 165–178; 7, 115–121; 8, 185–199; 9, 275–299; 10, 185–205.

firm. In the event, however, of a decrease in value during an inflationary period, the monetary figures expressed on the balance sheet become even more heterogeneous and nonuniform than their fundamental dissimilarity already presupposes. This adds together to make for many serious implications in the interpretation of the balance sheet unless form rather than substance is to prevail. Expressed slightly differently, when price levels change substantially over a period of several years, the figures presented on the financial condition statement are combined and presented in the same manner as if they all represented identical money values.

In order to illustrate the effects of inflation or deflation, assume that a business firm has $3,000 cash on hand and that $750 of this is expended for some item relating to the activities of the enterprise. The cash balance would then be $2,250 according to the properly kept records of the business. Suppose, on the other hand, that the purchasing power of the monetary unit declined 25 per cent without any direct physical cash outlay. In the latter instance it would be regular accounting procedure to omit any entry for the decline in the economic resources of the firm even though the advocates of stabilized accounting insist that the decline in the latter case is just as "real" as in the former instance.

The size of the effect of inflation or deflation on the balance sheet is dependent upon two variables, namely, (1) the length of the time interval between the statement dates and (2) the percentage change in the purchasing power of the monetary unit. When the ill effects of both of these factors are combined in the same direction, the figures presented on the balance sheet may be so harmful as to negate their usefulness in any manner. For instance, in the six-year interval from 1914 to 1920 the value of the dollar fell about 50 per cent, while in the period 1939 to 1951 another sharp drop occurred. It has been suggested that action taken on the basis of data supplied by unadjusted and unstabilized balance sheets may have been partially responsible for the later periods of downswing and depression.[6]

**Stabilized accounting concept of capital.** As indicated in Chapter 2, it is difficult to define capital in a manner satisfactory to all; however, the principal sponsor of stabilized accounting has stated that "capital is the present advantage of a right to receive an expected economic benefit." [7] Some authorities prefer to stress the source of capital rather than attempt to define it. For example, under one line of reasoning capital is for the most part a reflection of its cost of production; under the opposite explanation, capital depends upon its productivity — this view stresses the currentness of the source of capital. Although it is often easier to understand,

[6] Sweeney, 9 *Accounting Review* 299.
[7] Sweeney, 8 *Accounting Review* 198.

the future-productivity concept is more detached and troublesome to grasp under actual conditions of fluctuating monetary units. The past cost of production concept, on the other hand, is time honored, since it comes close to being the historical cost valuation plan which accountants have supported for many years; but, according to the advocates of stabilized accounting, it gives insufficient emphasis to the future productivity of the capital good to its marginal user. This latter view, i.e., the present cost to replace in relation to present market price, is the one which dominates the thinking of the group which favors stabilized accounting.

Under stabilized accounting there is a strong insistence that the valuation of property should be based at the minimum on current, up-to-date, replacement cost. This dollar amount may not exactly equal the future productivity of the capital good item under consideration at any given moment; the reproduction cost should, however, in practically every case be a smaller figure. This relatively lower amount would serve to give the valuation process a conservative tinge, even though the historical cost figure might be more conservative in a period of rising prices. The latter additional conservatism is not viewed with favor by the stabilized accounting group since they emphasize so much the adherence to replacement cost as the most appropriate measure of asset valuation.

The problems and difficulties of capital maintenance (regardless of how capital is determined) are also stressed by the proponents of stabilized accounting. Of course, as discussed in Chapter 14, there is no one universally accepted meaning of capital maintenance.[8] The view that appeals most to stabilized accounting is the one which insists that the capital of the individual business unit should be maintained relatively; that is, the capital of the firm should be preserved in the identical proportion to which the capital of the entire national economy is maintained. Expressed differently, this interpretation of capital maintenance would mean that the business enterprise capital should be reduced in a period of inflation or deflation only if the national economy is impoverished. The other popular meaning of capital preservation, namely, maintaining a nominal dollar sum such as $50,000, would not necessarily allow the individual firm to hold its relative position in the economy. Except in periods of rapidly changing prices the adherence to the nominal dollar preservation concept of capital maintenance does not cause any major ill effects. Of course, this view of capital maintenance is the one most frequently adopted since there is a strong force of habit supporting it as well as tax regulations and statutes. The advocate of stabilized accounting, however, insists that this notion may be positively harmful from the standpoint of carrying out one of the primary purposes of the accounting process, namely, the presenta-

[8] Davidson, 25 *Accounting Review* 45.

tion of data which will indicate whether the purchasing power equivalence of the invested capital is being maintained.

When one contemplates measuring capital, he is confronted with at least three significant possible classes of measuring units. The first he may adopt is some habitual physical or material unit, such as tons, barrels, square feet, etc. This method is, of course, widely employed for certain purposes, but is unacceptable to stabilized accounting since it stresses outward form rather than inner substance and is contradictory to the goal of economic endeavor. The second class is associated with money units. Again, this type of unit is frequently used to obtain a value figure for capital in the case of a going business, but it is concerned with what the stabilized accounting proponent calls nominal capital; it is thus not closely enough associated with the fundamental goal of economic endeavor. In a period of rising prices this measuring unit for capital determination is also unduly conservative. The third measuring unit possible is the general, or special, index of prices which reflects the purchasing power of economic resources. This is the only measuring unit which allows capital maintenance data to be presented in a form satisfactory to the goals which are expected to be attained under stabilized accounting. The choice between the selection of a general index of prices and a special commodity series depends upon what is assumed to be the economic force underlying human effort. If, for instance, the principal motivation is concerned with all goods and services, a general index of prices would be used to measure capital and capital maintenance. But if, on the other hand, the original capital invested and any increments thereto have been dedicated to the purchase of some specific good or service, the index of prices used as a measure of capital should be the one which reflects the price movements in that identical good or service. Of course, if the gain can be differentiated from the good itself, and if such gain is to be applied to the acquisition of some identified object or service, the general index of prices should still be adopted for the measuring unit insofar as the capital is concerned.

**Stabilized depreciation.** Closely allied to the stabilized accounting concept of capital, as developed in the preceding section, is the question of the type of depreciation accounting which will come closest to maintaining the capital of the business unit. Of course, the advocate of stabilized accounting insists that real (purchasing power equivalent) capital is the type which should be preserved, if possible. It follows, therefore, that the most obvious way of accomplishing this goal is to distribute the original cost of the asset over its life in such a manner that the depreciation charge each period, stated in terms of the average price level for the same period, will represent the identical purchasing power capital portion as it would if stated in terms of the general price level obtaining at the time the asset

was originally acquired.[9] This view of depreciation should be contrasted with the unstabilized, regular accounting treatment which takes the position (1) that the monetary unit constantly has the same purchasing power and (2) that by prorating the historical cost of the asset over its life a comparable economic significance will be obtained in relation to the time when the business property was acquired. This treatment of depreciation has, of course, the merit of being simple to compute in comparison with any other procedure; the supporter of stabilized accounting, however, immediately would point out that under- or over-maintenance of real economic capital eventually would result. In addition, as will be brought out in more detail in a later section, the stabilized accounting supporter believes that the periodic income of the business unit is not appropriately stated when original cost is used as a base for measuring depreciation.

Some accountants take the view that the objectives of stabilized depreciation accounting can be accomplished by using the reproduction cost of the asset as a base for measuring the periodic depreciation charge. It is their argument that since depreciation-on-cost stresses only the historical dollar cost, the adoption of a reproduction cost base will preserve within the enterprise a sufficient number of dollars to maintain the physical form and efficiency of the plant and equipment (assuming, of course, that the realized revenue each period is in excess of all outlays and charges including depreciation). While it may be concluded that the use of reproduction cost does present dollar figures which are close to the desired goal under stabilized accounting, there remains the objection that only absolute individual enterprise capital is maintained rather than the relative purchasing power equivalent in dollars. The use of reproduction cost as a base also suffers from its emphasis on replacing of identical assets which may not be available when replacement is needed. In many instances, also, there may be no desire to acquire again an identical piece of property because of progress in the arts or mechanical improvements. Stated in technical terms, reproduction cost depreciation is calculated on the current special commodity price level index number equivalent of original cost while stabilized accounting depreciation is figured on the general commodity price level equivalent of original cost. As will be discussed later in this chapter, both procedures involve the selection of appropriate index numbers; this selection may offer much room for individual opinion and judgment.

**Stabilized appreciation.** As noted very briefly in Chapter 2, the advocates of stabilized accounting believe that appreciation is simply the excess of reproduction cost over real (purchasing power) cost of the asset under consideration at the moment. It was pointed out in Chapter 11, however,

[9] Sweeney, 6 *Accounting Review* 178.

that accountants have generally in the past insisted on the view that appreciation should be defined as the difference between reproduction cost and original historical cost. (Logically, appreciation would be the resultant only when current cost is in excess of past cost — the term "devaluation" is employed when the situation is reversed.)

As to the fundamental nature of appreciation, the traditional majority accounting view is that it is a special class of surplus (if it is recorded on the books). A minority opinion is that appreciation is wholly enterprise capital. The stabilized accounting view, on the other hand, leans toward the suggestion that appreciation is part income and part real (purchasing power) capital; the dollar amount assigned to each depends upon how much of the appreciation is required to state the historical cost of the property in terms of the current general price structure. If there are any appreciation dollars left over after the preceding calculation has been made, they would be treated as income (some realized and some unrealized — see illustration of stabilized accounting later in this chapter). The extent to which stabilized appreciation should be reported as realized income depends upon the degree of certainty as to the real existence of the appreciation. The certainty is accentuated or made positive by the purchasing of, or holding back of, new property larger in dollar sum than the amortized cost (at the time) of the asset being substituted. These additional items of property are usually purchased for cash or cash equivalent; the realized appreciation on those held back, however, is most frequently accomplished by amortization, depreciation, or write-off.

The most prominent exponent of stabilized accounting [10] has explained the realization of appreciation as follows: Suppose a piece of equipment is purchased at the beginning of a fiscal period for $1,000 with an estimated useful life of two years. During the first year the price index for this item moved from 100 to 225, while the index of general prices for all commodities and services rose from 100 to 150. If, at the end of the first year, this item were sold for a figure in excess of the book value ($500), the entire excess would be realized appreciation under the regular accounting view. Opposing this, however, the stabilized accounting proponent would insist that only the excess over $750* should be reported as realized appreciation. If the asset is not sold and if depreciation was based on reproduction cost, the regular accounting view would be that $625† of the appreciation became realized during the first year. But under stabilized accounting, the total depreciation for the initial fiscal period is $750, and the amount of realized appreciation is only $375.‡

[10] Sweeney, 7 *Accounting Review* 118.

* [(150% × $1,000) ÷ 2 years].

† [(225% × $1,000) ÷ 2 years] − $500 (depreciation based on cost).

‡ [(225% × $1,000) ÷ 2 years] − $750.

From the standpoint of the accounting statements the stabilized accounting enthusiast believes that the realized appreciation, as determined above, is for all practical purposes a special credit to Profit and Loss account and would thus appear on the periodic income statement. As a less desirable alternative, the amount of appreciation which is considered to be realized could be shown as a credit to Earned Surplus account or to an adequately described reserve presented in the proprietorship section of the balance sheet. All of this assumes, of course, that current period depreciation is calculated on the cost of reproduction and, further, that this reproduction cost has been recorded in the plant and equipment accounts. It is not necessary, however, to record on the books and statements the higher (in the illustration given above) specific property reproduction cost, as compared with the general price level cost, but it may be more convenient and advisable to do so. In fact, a plan has been worked out (see problem given later in this chapter) whereby there is no necessity at all of changing the book accounts simply because the price level moves up or down. Yet the goals of stabilized accounting can still be accomplished.

**Stabilized accounting concept of income.** The advocate of stabilized accounting customarily thinks of income as synonymous with the obtaining of periodic economic benefits. It is definitely related, therefore, to the securing of gains or improvements of an economic nature. Under stabilized accounting the concept of income encompasses what the accountant has traditionally called "operating profit" as well as gross fixed or current asset price increments; the latter do not necessarily have to be realized in the usual sense of the word. In all accounting reports, however, there should be a separation or division of the realized items of income from the unrealized group. The presentation of both realized and unrealized income on a statement is admittedly unconventional; its strangeness is due to the prevalent notion that periodic revenue is about the same as realized revenue. An example [11] will serve to indicate the distinction:

Suppose a small business was started on January 1 with an investment of $500. A short while later these dollars were used to buy some merchandise, say jewelry. The items were then marked to sell for $650. Nothing else happened during the year until December 31, when the owner received a firm order from a customer for all the items at the tagged price. After considering the matter until January 2 of the next year, he sold the jewelry for cash. There were no changes in wholesale or retail price levels during the year the business held the merchandise. Query: When should the revenue be reported? The regular accounting view supporter would immediately reply, "The second year, since that is the year of sale." The supporter of stabilized accounting, on the other hand, would insist that

[11] Sweeney, 8 *Accounting Review* 334–335.

there was $150 of earned, though not realized, gross income in the first year, since that was the period during which the jewelry had its increment; in the second year there would, of course, be $150 of income realized, though not earned, as well as an unrealized loss of $150, the algebraic total being zero. While the realized income for the two years jointly would be the same under both the regular and stabilized accounting views, the proponents of the latter believe that the statements of income for each year would be much more helpful documents, as well as more informative. (Note: The $150 unrealized loss in the second period results from the giving up of the $150 unrealized revenue on the jewelry because of the final sale; it is thus a natural concomitant of the stabilized accounting procedure which makes the distinction between revenue which is earned but not realized and that which is realized though not earned. This bifurcation would not otherwise be possible.)

The stabilized accounting concept of income in periods of changing price levels (appreciation and devaluation) has already been discussed in previous sections of this chapter; the important difference between nominal dollar income and real purchasing power income thus needs no further elaboration at this point even though it is intimately associated with the fundamental tenets of stabilized income accounting.

**Technique of stabilized accounting.** As noted previously in this chapter, the basic device used in stabilized accounting is an index representing the general price level; this emphasis stems from the supposition that the economic activity of most people is motivated by their desire to obtain more of the world's products and services. More specifically, the index of general prices is used to measure as closely as possible the replacement cost of the inventory, plant, and equipment of the business firm in terms of the purchasing power equivalent of the original dollars invested in these items.

The advocate of stabilized accounting classifies assets and liabilities into two subvarieties, namely, (1) real value items and (2) money value items. These are not influenced in an identical manner by changes in the purchasing power of the dollar. The money value group, which includes cash, receivables, and payables, normally have a face amount which is a specified monetary sum; with few exceptions this sum cannot be changed except through contract revision. The real value assets include merchandise, land, buildings, machinery, equipment, investments in common stock of other companies, and common stock issued; these items are not ordinarily tied in with contracts and thus their value may change as the value of money moves up or down. Of course, it is widely known and recognized that losses or gains in purchasing power may result if money value assets are held in periods of inflation or deflation. What is lost or gained by the

debtor, however, is offset by the gains and losses of the creditor. But since enterprise accounting is essentially concerned with only one business unit, the eventual offsetting of gains and losses by debtors and creditors is not of major significance.

In stabilization procedures the price levels of different dates and periods of time could conceivably be used, but the plan most frequently recommended in this country involves the adoption of the price level existing at the date of the balance sheet which is being stabilized. Even after this decision has been made, there remains the option whether (1) to stabilize each ledger entry or (2) to stabilize only the balance sheet and the accompanying income statement. The second option is one which is ordinarily suggested in this country, but in the illustration below a compromise procedure is followed in order to show the rudiments of both methods.

The technique necessary in the stabilization of each entry involves the determination of the stabilized equivalent of the separate ledger entry; this may, however, sometimes be done by total debits and total credits. In the case of cash and merchandise it is often possible to adopt a first-in, first-out assumption; for receivables and payables the specific item sold or purchased is generally used. So far as the ledger accounts are concerned, the consequence of stabilization is reflected in accounts called "Balance Sheet Stabilization" and "Stabilization Profit and Loss"; the latter account is divided into realized and unrealized sections. Both of these accounts are carried in the regular ledger, and journal entries are prepared for closing them. They contain information which is useful in stabilizing the entries made in the usual real and nominal accounts.

The steps involved in achieving the other major stabilized accounting plan, i.e., balance sheet stabilization, may be outlined as follows: (1) Stabilize all real value assets and the owners' investments in the business; (2) stabilize unrealized surplus or deficit from changes in the value of money; (3) stabilize realized profit and loss on changes in the general value of money; (4) stabilize any changes in the ordinary book surplus during the period; (5) construct a combined stabilized and unstabilized balance sheet; (6) stabilize net sales or revenue and any extraordinary income or expense for the period; (7) stabilize total operating expenses; and (8) construct a stabilized formal income statement.[12] To reduce the work of computation, whole classes of related figures should be first converted to base-year equivalents, and only the totals should then be re-expressed in the current price level. Since it is usual for price indexes of most specific goods or services to move slower or faster than the general price index, realized appreciation will result only if the price index of the particular asset increases at a faster rate than the general price index.

[12] Sweeney, 10 *Accounting Review* 188–205.

This difference is considered income, but it is not formally recognized if the stabilized statements are based on cost. On the other hand, if the balance sheet is to be stabilized on the basis of reproductive cost rather than original cost, the real value assets must still be stabilized on the basis of original cost in order that stabilized appreciation, the excess of reproduction cost over stabilized original cost, may be determined.

The following illustrative problem is presented to illustrate the techniques involved in balance sheet stabilization. It is simplified to conserve space, but the technique is adequately illustrated.

### *Illustrative Problem*

Given the following accounts, index numbers, and amounts, prepare a stabilized balance sheet as of the end of the period and a formal income statement for the period, if the general price index were 150 as of the end of the period. The index numbers given in the accounts are those existing at the date of the transactions. Use the first-in, first-out method for cash and merchandise and the specific-item method for receivables and payables.

**Cash**

| Index | | Amount | Index | | Amount |
|---|---|---|---|---|---|
| 100. | (A) | $15,000 | 125. | (B) | $ 3,600 |
| 125. | (E) | 11,250 | 120. | (C) | 9,000 |
| | | | 145. | (G) | 4,350 |
| | | | 150. | (H) | 4,200 |
| | | | 140. | (C) | 2,100 |
| | | | Bal. | | 3,000 |
| | | $26,250 | | | $26,250 |
| Bal. | | $ 3,000 | | | |

**Accounts Receivable**

| | | | | | |
|---|---|---|---|---|---|
| 125. | (D) | $11,700 | 125. | (E) | $11,250 |
| 160. | (I) | 9,600 | Bal. | | 10,050 |
| | | $21,300 | | | $21,300 |
| Bal. | | $10,050 | | | |

**Merchandise**

| | | | | | |
|---|---|---|---|---|---|
| 120. | (C) | $ 9,000 | To P. and L. | (K) | $13,500 |
| 125. | (F) | 11,250 | Bal. | | 6,750 |
| | | $20,250 | | | $20,250 |
| Bal. | | $ 6,750 | | | |

**Equipment**

| | | |
|---|---|---|
| 125. | (B) | $ 3,600 |

**Reserve for Depreciation**

| | | | | | |
|---|---|---|---|---|---|
| | | | 125. . . . . | (J) | $ 360 |

**Accounts Payable**

| | | | | | |
|---|---|---|---|---|---|
| 145. . . . . | (G) | $ 4,350 | 125. . . . . | (F) | $11,250 |
| Bal. . . . . | | 6,900 | | | |
| | | $11,250 | | | $11,250 |
| | | | Bal. . . . . | | $ 6,900 |

**Capital Stock**

| | | | | | |
|---|---|---|---|---|---|
| | | | 100. . . . . | (A) | $15,000 |

**Earned Surplus**

| | | | | | |
|---|---|---|---|---|---|
| 140 Dividends Paid . . . | (O) | $ 2,100 | P. and L. . . . . | (N) | $ 3,240 |
| Bal. . . . . | | 1,140 | | | |
| | | $ 3,240 | | | $ 3,240 |
| | | | Bal. . . . . | | $ 1,140 |

**Profit and Loss**

| | | | | | |
|---|---|---|---|---|---|
| Expenses. . . . . | (L) | $ 4,560 | Sales . . . . . | (M) | $21,300 |
| Cost of Sales . . . . . | (K) | 13,500 | | | |
| Profit to Surplus . . . . | (N) | 3,240 | | | |
| | | $21,300 | | | $21,300 |

**Sales**

| | | | | | |
|---|---|---|---|---|---|
| To P. and L. . . . . | (M) | $21,300 | 125. . . . . | (D) | $11,700 |
| | | | 160. . . . . | (I) | 9,600 |
| | | $21,300 | | | $21,300 |

**Expenses**

| | | | | | |
|---|---|---|---|---|---|
| 150. . . . . | (H) | $ 4,200 | To P. and L. . . . . | (L) | $ 4,560 |
| 125. . . . . | (J) | 360 | | | |
| | | $ 4,560 | | | $ 4,560 |

*Solution*

(I.R. indicates index ratio)

Step 1. Stabilize all real value assets and the owners' investment in the business.

| Debits | | | | Credits | | |
|---|---|---|---|---|---|---|
| Unstab. | I.R. | Stab. | Account | Unstab. | I.R. | Stab. |
| $6,750 | 150/125 | $8,100 | Inventory | | | |
| 3,600 | 150/125 | 4,320 | Equipment | | | |
| | | | Res. for Depr. | $ 360 | 150/125 | $ 432 |
| | | | Capital Stock | 15,000 | 150/100 | 22,500 |

Step 2. Stabilize unrealized surplus or deficit from changes in the value of money.

| | Actual Current Balance | Balance Stabilized by Dates of Origin | | Unrealized Profit or Loss* |
|---|---|---|---|---|
| | | I.R. | Amount | |
| Cash | $3,000 | 150/125 | $3,600 | $ 600* |
| Accounts Receivable | 9,600 | 150/160 | 9,000 | 600 |
| . . . . . | 450 | 150/125 | 540 | 90* |
| Accounts Payable | 6,900 | 150/125 | 8,280 | 1,380 |
| | | | | $1,290 |

Step 3. Stabilize realized profit or loss on changes in the general value of money.

**Stabilization of Increases by Dates of Origin and of Decreases by Dates of Occurrence**

| Debits | | | | Credits | | |
|---|---|---|---|---|---|---|
| Unstab. | I.R. | Stab. | Account | Unstab. | I.R. | Stab. |
| $15,000 | 150/100 | $22,500 | Cash | $ 3,600 | 150/125 | $ 4,320 |
| 11,250 | 150/125 | 13,500 | | 9,000 | 150/120 | 11,250 |
| | | | | 4,350 | 150/145 | 4,500 |
| | | | | 4,200 | 150/150 | 4,200 |
| | | | | 2,100 | 150/140 | 2,250 |
| $26,250 | | $36,000 | | $23,250 | | $26,520 |
| $11,700 | 150/125 | $14,040 | Accounts | | | |
| 9,600 | 150/160 | 9,000 | Receivable | $11,250 | 150/125 | $13,500 |
| $21,300 | | $23,040 | | $11,250 | | $13,500 |
| $ 4,350 | 150/145 | $ 4,500 | Accounts | | | |
| | | | Payable | $11,250 | 150/125 | $13,500 |
| $ 4,350 | | $ 4,500 | | $11,250 | | $13,500 |

**Computation of Realized Profit or Loss**

| | Cash | Accounts Receivable | Accounts Payable |
|---|---|---|---|
| Total increases by dates of origin | $36,000 | $23,040 | $13,500 |
| Add: Opening balances by dates of origin | ..... | ..... | ..... |
| Totals | $36,000 | $23,040 | $13,500 |
| Less: Closing balances by dates of origin | 3,600 | 9,540 | 8,280 |
| Totals | $32,400 | $13,500 | $ 5,220 |
| Less: Decreases by dates of occurrence | 26,520 | 13,500 | 4,500 |
| Realized Profit or Loss* | $ 5,880* | -0- | $ 720 |
| Net Realized Profit or Loss* | | $ 5,160* | |

Step 4. Stabilize any changes in the book earned surplus during the period (e.g., dividends paid).

| Debits | | |
|---|---|---|
| Unstab. | I.R. | Stab. |
| $2,100 | 150/140 | $2,250 |

Step 5. Construct a combined stabilized and unstabilized balance sheet. The realized profit or loss* is computed as follows:

1. Compute the stabilized proprietorship by deducting the stabilized liabilities from the stabilized assets. ($25,038 − $6,900 = $18,138)
2. Compute the net stabilized surplus or deficit by deducting the stabilized capital stock from stabilized proprietorship. ($18,138 − $22,500 = $4,362*)
3. Compute realized surplus by deducting unrealized surplus from the net stabilized surplus. ($4,362* − $1,635 = $5,997*)
4. Compute the realized net income as follows: Realized net surplus at close of the period, less realized surplus at beginning of the period, plus dividend paid. ($5,997* + $2,250 = $3,747*)

**Balance Sheet**
At the Close of the Fiscal Year

| Assets | | Unstabilized | | Stabilized |
|---|---|---|---|---|
| Cash | | $ 3,000 | | $ 3,000 |
| Accounts Receivable | | 10,050 | | 10,050 |
| Merchandise Inventory | | 6,750 | | 8,100 |
| Equipment | $ 3,600 | | $4,320 | |
| Less: Reserve for Depreciation | 360 | 3,240 | 432 | 3,888 |
| | | $23,040 | | $25,038 |
| **Liabilities and Capital** | | | | |
| Accounts Payable | | $ 6,900 | | $ 6,900 |
| Capital Stock | | 15,000 | | 22,500 |
| Earned Surplus: | | | | |
| Realized: | | | | |
| Net profit or loss* | $3,240 | | $3,747* | |
| Less: Dividend paid | 2,100 | | 2,250 | |
| | $1,140 | | $5,997* | |
| Unrealized profit or loss* | −0− | 1,140 | 1,635 | 4,362* |
| | | $23,040 | | $25,038 |

Step 6. Stabilize net sales or revenue and any extraordinary income or expense for the period.

| | | Credits | |
|---|---|---|---|
| | Unstab. | I.R. | Stab. |
| Sales | $11,700 | 150/145 | $14,040 |
| | 9,600 | 150/160 | 9,000 |
| | $21,300 | | $23,040 |

Step 7. Stabilize total operating expenses.

| | |
|---|---|
| Realized net income or loss* for the period | $ 3,747* |
| Less: Realized net gain or loss* on money value changes | 5,160* |
| Net income from business activity | $ 1,413 |
| Less: Net sales | 23,040 |
| Operating expenses and cost of sales | $21,627 |

Step 8. Construct a stabilized income statement for the period.

**Statement of Income**
For Fiscal Year Now Ended

| Realized | Unstabilized | Stabilized |
|---|---|---|
| Net sales | $21,300 | $23,040 |
| Less: Operating expenses and cost of sales | 18,060 | 21,627 |
| Net profit on operations | $ 3,240 | $ 1,413 |
| Profit and loss* on changes in money value | –0– | 5,160* |
| Realized profit or loss* for the period | $ 3,240 | $ 3,747* |
| Unrealized | | |
| Profit or loss* from changes in money value | | $ 1,635 |

The preceding illustrative problem, although simplified in many respects, shows the application of stabilized accounting technique. With an ending decrease in the purchasing power of the dollar of 33⅓ per cent, it is seen that an orthodox accounting profit of $3,240 was actually a loss of $3,747 when expressed in the general purchasing power equivalent of the dollar. A study of the problem will bring out more clearly the many points emphasized in the previous discussion in this chapter.

**Objections to stabilized accounting.** Even though the technique of stabilized accounting has been known for many years, it has never as such proved popular in this country. Several subvarieties of the general method have, however, been recommended and adopted from time to time; some of these are discussed in the next section. Before taking these up, the principal stated objections to stabilized accounting are briefly noted.

The principal advocate of stabilized accounting has divided the objections into two groups, one of which he calls "sound" and the other "unsound." [13] The first possibly "sound" objection is that the general index of prices may not be accurate. As one writer has stated, the accuracy of index numbers as an expression of price changes of a defined group of commodities depends on several factors or conditions. These may be summarized as follows: [14] (1) the relative importance assigned to the commodities used in the index so as to represent accurately the whole of the transactions in the group, (2) the manner in which these price changes are combined, and (3) the inexactness that arises from the fact that in nearly all the cases the price changes used are but a sample of all existing price changes. Of course, an attempt is made to select typical product and service items; the sample, therefore, is not at random in most cases. Another writer has asserted that the weaknesses of stabilized accounting far offset its benefits and

[13] (1936) Sweeney 186. This authority gives an exhaustive reply to the critics of stabilized accounting.

[14] Mancina, 11 *Journal of Business* 148. For an extended treatment of this matter see a statement by the Research Department of the American Institute of Accountants, 87 *Journal of Accountancy* 312.

advantages.[15] It is his view that the use of any general index of prices will be deceptive in that it will not present the actual purchasing power of a given business unit and that accounting has been traditionally concerned with only one enterprise at a time. Further, purchasing power is of significance only in relation to an estimated ability or potential to acquire specific desired objects or services; the use of a general index is therefore contradictory to economic realities. The point is also made that stabilized accounting does not separate the profit due to price changes of specific items of property (due to market conditions) from profit arising from changes in the general purchasing power of money. This same writer does not like the loss or gain treatment of the difference between cost-price dollars and purchasing-power dollars; he believes any such gain or loss is "erroneous."

The second possibly "sound" objection is that a daily general price index should be used instead of the usual published monthly series recommended by Sweeney and others. The advocates of stabilized accounting do not believe this objection to be valid, since prices do not customarily move percentagewise very much in a single month. Yet a daily index could be used, if desired, in a period of extreme inflation or deflation.

A third possibly "sound" objection is that stabilized accounting is not practical in the United States. Any test of practicality, of course, is associated with relative difficulty and expense of obtaining the required (or desired) data. It is likely that stabilized accounting would not be worth while in the cases (1) of small, newly established business units in which prices have not changed to any extended degree, and (2) in any enterprise where the general price level has not moved at least 5 per cent during the fiscal period being stabilized.

A fourth possibly "sound" objection is that stabilized accounting statements usually cannot be prepared promptly enough for effective use. This again is a relative matter, and the criticism can be met by carefully planning and organizing the accounting effort. The adoption of the natural business year would also allow the public accountant to do his part of the stabilizing at a time other than his busy season. Other aids to promptness could also be adopted, such as (1) the use of preliminary unaudited figures and (2) the adoption of end-of-month general indexes of prices instead of average-for-month indexes (which take more time to calculate and publish).

A fifth possibly "sound" objection is that stabilized accounting is too complicated. In other words, if persons are now misled or confused by regular accounting methods, they would likely be even more confused by index number adjustments. Stabilized accounting might also be considered

[15] Griffith, 12 *Accounting Review* 123.

contradictory to the modern goal of greater simplicity in accounting statements.[16] The ordinarily stated reply to all these objections is that business complexity gives rise to the need for stabilized accounting and that whatever is inherently complex cannot be made simple except to the informed individual. "Our increasing knowledge of economic relationships can be expressed and understood only in terms of some . . . more complex technique. This proposition appears to be as elementary and as fundamental as the fact that the relationships which prevail in a highly developed civilization cannot be expressed in the language of a primitive people." [17] Further, the complexity of stabilized accounting may be in its application rather than in its understanding; the latter could be overcome by careful phrasing of explanatory notes accompanying the financial statements.

The sixth possibly "sound" objection is that stabilized accounting is extraneous to the established goals of the accounting process.[18] This objection is associated with the propositions that (1) accounting is essentially historical in nature and therefore needs no adjusting to "current" purchasing-power dollars, (2) if stabilizing is warranted it should be carried out by statisticians rather than by accountants, (3) stabilizing is not intimately related to bookkeeping but rather to statement analysis and interpretation, and (4) any methodology which deemphasizes the concepts of legal debts and property rights falls far short of portraying business conditions and position successfully. The usual reply to these objections is that under the generally recommended technique of stabilized accounting the book accounts are not adjusted or changed; regular, legal, accounting statements can still be prepared. Further, it is idle to argue whether stabilization of data is accounting or statistical; what is more important is that the work of stabilized accounting be carried out by qualified personnel.

Space does not permit an extended treatment of the "unsound" objections. Some of them are: (1) present accounting methods have proved good enough in the past, (2) stabilized accounting is unnecessary because allowance is already made for the errors in unstabilized accounting, (3) stabilized accounting would hinder the preparation of tax returns, and (4) by using the current general price index, stabilized accounting unconservatively values assets at current market price.

**Alternative methods based on stabilized accounting.** In the period during and following World War II, the purchasing power of the dollar decreased markedly. In view of the relative unpopularity of the straightforward stabilized accounting methodology,[19] several accountants have

[16] Davidson, 25 *Accounting Review* 56–57.
[17] Scott, 4 *Accounting Review* 226.
[18] Greer, *1949 Proceedings of Ohio State University Institute on Accounting* 19; Mackenzie, 24 *Accounting Review* 363.
[19] See Greer, *1949 Proceedings of Ohio State University Institute on Accounting* 19–25.

suggested and developed varied alternatives for meeting the accounting and economic problems of a declining value monetary unit.

**Capital price adjustment method.**[20] This method has two underlying suppositions associated with it: (1) It is taken for granted that the accounts of the business unit must continue to be kept in dollars of nominal purchasing power, and (2) in order to preserve the real purchasing power of the owners' investment during periods of rising prices, a constantly increasing number of dollars must be reinvested in the firm. The capital price adjustment method recognizes each of the preceding propositions. The procedure to be employed in accomplishing the objectives involves (1) pricing the business property and income in dollars as usual, and (2) charging the current period revenue with an amount sufficient to offset the decline in the real purchasing power of the invested equity capital. The credit for the charge just noted would be to an account called "Capital Price Adjustment." As a practical example, suppose that the price index measuring the purchasing power of capital in the particular industry should rise thirty per cent during a certain period. In order to carry on the usual volume of business, the firm (according to the advocates of this method) would soon need thirty per cent more working capital. This thirty per cent would therefore be charged against current period revenue and added to the Capital Price Adjustment account. On the other hand, if prices in the industry drop, the reverse treatment would be employed. Incidentally, the charge or credit on the income statement would be treated as a nonoperating item.

Assuming that the level of prices continues on the higher plane, a further adjustment will be necessary in order to take care of the increased number of dollars required to buy plant and equipment to take the place of items discarded or scrapped. Under the capital price adjustment method, the usual amount of depreciation (based on cost) would be supplemented by a dollar charge equal to the percentage rise in the replacement cost over original cost. In addition, the total depreciation reserve for prior periods would have to be increased proportionately to the rise in industry prices. A separate Reserve for Price Adjustment account is suggested for handling the increase-over-usual depreciation charge. For all plant and equipment items disposed of, an amount representing the additional cost would be charged to the Reserve for Price Adjustment account and credited to the Capital Price Adjustment account. When plant items are replaced, therefore, the additional cost of the property (because of higher price levels) would be offset by the increase in the invested capital. The Reserve for Price Adjustment account is not deducted from the assets on the balance sheet.

[20] Adapted by permission from Freeman, 29 *N.A.C.A. Bulletin* 635–658 (exhibit is a direct quotation).

Rather, it is added to the Capital Price Adjustment account in the proprietorship section of the statement. In order to illustrate the treatment of these reserves the following assumptions are made: (1) Depreciable assets on hand have risen in price fifty per cent since they were acquired (up to the beginning of the period) and to sixty per cent at the end of the period; (2) the older assets discarded during the period are replaced at a cost which is seventy-five per cent higher than their historical cost; (3) no previous replacements have been made at a price level greater than historical cost. At the close of the fiscal period, the Reserve for Price Adjustment account must be corrected to an amount which will allow the final balance to be presented on the financial statement at a figure not in excess of change in the price level since the original purchase of the assets then owned by the business unit. The mechanics of doing this are illustrated in the table below:

| Details | Plant Asset Account (A) | Capital Price Adjustment Account (B) | Depreciation Reserve Account (C) | Reserve Price Adjustment Account (D) | Per cent of Column (D) to Column (C) (E) |
|---|---|---|---|---|---|
| Balances at beginning of period | $18,000 | –0– | $8,000 | $4,000 | 50 |
| Discards during period: | | | | | |
| Cost | $ 2,000 | $1,500 | $2,000 | $1,500 | 75 |
| Salvage | 175 | ..... | $ 175 | ..... | ..... |
| Salvage transfer | ..... | ..... | 75 | $ 75 | ..... |
| Salvage amount after transfer | ..... | ..... | $ 100 | $ 75 | 75 |
| Balance | $ 1,825 | ..... | $1,900 | $1,425 | 75 |
| Remainder | $16,000a | $1,500 | $6,100 | $2,575 | 42.2 |
| Add from Profit and Loss: | | | | | |
| Adjustment to end of period price level | ..... | ..... | ..... | $1,085 | 17.8b |
| Depreciation for period | ..... | ..... | 2,000 | 1,200 | 60 |
| Total from Profit and Loss | ..... | ..... | ..... | $2,285 | ..... |
| Replacements during period | 3,500 | –0– | ..... | ..... | ..... |
| Additions and betterments | –0– | –0– | ..... | ..... | ..... |
| Balances at end of period | $19,500 | $1,500 | $8,100 | $4,860c | 60 |

a. $18,000 – $2,000. b. 60% – 42.2%. c. $2,575 + $2,285.

In the event that the industry index of prices had declined rather than increased, an identical general methodology would have been pursued with the single exception that the Reserve for Price Adjustment account would reflect a debit balance at the end of the period.

The Capital Price Adjustment account is not in any way the equivalent of reappraisal surplus since the cost of the assets of the business is not increased or decreased on the balance sheet or in the accounts. So far as the balance sheet is concerned, therefore, any credit balance in the Capital Price Adjustment account would represent an additional item of proprie-

torship, while a debit balance would be presented as an unallocated deduction from the combined total of the other proprietorship items.

The proponents of this method insist that it is much simpler than the plans which involve the repricing of each item on the balance sheet in terms of some index number. It is also argued that the method under discussion (1) offers the most practical way of providing the resources needed to protect the equity invested capital of the enterprise, and (2) helps the persons interested in business to appreciate more vividly the economic effects of changes in price levels.

**Common dollar reporting.**[21] This particular adaptation of stabilized accounting, like the one described above, assumes that original cost data are to be retained on the books of account. It differs from the capital adjustment plan, however, in that no additional, perhaps unusual, account titles are to be placed on the ledger. In other words, all the adjustments are made on the face of the financial statements; no adjustments are necessary if prices remain relatively stable. In the two statements given on pages 567–568 the base year selected is 1926 and the price indexes used for the three years 19(A), 19(B), 19(C) are purely hypothetical. The advocates of this method recommend simply that a "good representative index" be used in the following manner: (1) Use a general commodity price index for revenue, cash, receivables, accrued taxes, and dividends declared in cash. (2) Use for all other items the index which was current at the moment (or during the period) the item came within the control of the business enterprise; in this manner, some indexes are carried forward, especially those concerned with the acquisition of plant, equipment, and related depreciation reserves.

The reader will observe that in Exhibit 1 (Balance Sheets) the earned surplus figure (adjusted columns) is not calculated by means of a price index; rather, it is determined by deducting the total of the adjusted liabilities and capital stock from the total adjusted assets. It is also necessary on Exhibit 2 to supply an amount labeled "Loss due to purchase of assets at inflationary prices" in order to make the adjusted income data tie in with the last line on the adjusted balance sheets. This means that a greater number of dollars (as related to the base period) have left the enterprise than can be explained away by the adjusted income statements (down to the line headed "Net profit after taxes"). This differential may be attributed to the fact that in the illustration it is assumed that assets are being replaced at a constantly increasing price level.

**Three-part income statements.** In commenting on the goals of stabilized accounting, an English writer has stated: "If accounting is ever to be ele-

[21] Adapted by permission from Heffner, 30 *N.A.C.A. Bulletin* 519–526 (exhibits are direct quotations).

EXHIBIT 1

## THE GENERAL BUSINESS CORPORATION

### Adjustment of Comparative Balance Sheets to a Common Dollar Basis

| ASSETS | Actual cost basis | | | Price index standings | | | Adjusted to 1926 dollars | | |
|---|---|---|---|---|---|---|---|---|---|
| | 19(C) | 19(B) | 19(A) | 19(C) | 19(B) | 19(A) | 19(C) | 19(B) | 19(A) |
| *Current assets:* | | | | | | | | | |
| Cash and receivables — net | $ 45,900 | $ 44,535 | $ 42,100 | 156 | 120 | 105 | $ 29,423 | $ 37,113 | $ 40,095 |
| Temporary investments — at cost | 20,150 | 20,000 | 25,800 | 149 | 141 | 137 | 13,523 | 14,184 | 18,832 |
| Prepayments | 2,500 | 2,350 | 2,200 | 156 | 123 | 108 | 1,603 | 1,911 | 2,037 |
| Inventories — at lower of cost (first-in, first-out basis) or market | 40,000 | 38,900 | 37,000 | 167 | 135 | 117 | 23,952 | 28,815 | 31,623 |
| Total current assets | $108,550 | $105,785 | $107,100 | | | | $ 68,501 | $ 82,023 | $ 92,587 |
| *Investments and other assets* — at cost less depreciation or amortized premium | 10,000 | 2,525 | 2,050 | * | ** | *** | 6,805 | 1,882 | 1,546 |
| *Property, plant, and equipment* — at cost less reserves for depreciation | 52,200 | 53,400 | 44,500 | † | †† | ††† | 52,030 | 53,233 | 46,842 |
| *Deferred charges* | 150 | 160 | 170 | 79 | 79 | 79 | 190 | 203 | 215 |
| Total assets | $170,900 | $161,870 | $153,820 | | | | $127,526 | $137,341 | $141,190 |
| LIABILITIES AND NET WORTH | | | | | | | | | |
| *Current liabilities:* | | | | | | | | | |
| Notes and accounts payable | $ 13,100 | $ 15,100 | $ 14,000 | 167 | 135 | 117 | $ 7,844 | $ 11,185 | $ 11,966 |
| Accrued salaries and wages | 4,800 | 3,200 | 2,700 | 236 | 208 | 193 | 2,034 | 1,538 | 1,399 |
| Accrued taxes | 21,000 | 13,500 | 22,000 | 156 | 120 | 105 | 13,462 | 11,250 | 20,952 |
| Other accrued liabilities | 2,500 | 1,700 | 1,400 | 156 | 123 | 108 | 1,603 | 1,382 | 1,296 |
| Total current liabilities | $ 41,400 | $ 33,500 | $ 40,100 | | | | $ 24,943 | $ 25,355 | $ 35,613 |
| *Bonds payable — 6%*, first mortgage, 20 year | –0– | 19,000 | 19,000 | 103 | 103 | 103 | –0– | 18,447 | 18,447 |
| *Net Worth:* | | | | | | | | | |
| Capital stock — 6,000 shares, no-par common | 65,500 | 65,500 | 65,500 | 79 | 79 | 79 | 82,911 | 82,911 | 82,911 |
| Earned surplus | 64,000 | 43,870 | 29,220 | | | | 19,672 | 10,628 | 4,219 |
| Total Net Worth | $129,500 | $109,370 | $ 94,720 | | | | $102,583 | $ 93,539 | $ 87,130 |
| Total liabilities and net worth | $170,900 | $161,870 | $153,820 | | | | $127,526 | $137,341 | $141,190 |

* $8,425 at 149; 500 at 133; 575 at 137; 500 at 141

** $950 at 130; 500 at 133; 575 at 137; 500 at 141

*** $975 at 130; 500 at 133; 575 at 137

† $ 9,700 at 133; 42,500 at 95

†† $ 9,900 at 133; 43,500 at 95

††† $44,500 at 95

EXHIBIT 2

## THE GENERAL BUSINESS CORPORATION

### Adjustment of Comparative Profit and Loss Statements to a Common Dollar Basis

| | Actual cost basis | | | Price index standings | | | Adjusted to 1926 dollars | | |
|---|---|---|---|---|---|---|---|---|---|
| | 19(C) | 19(B) | 19(A) | 19(C) | 19(B) | 19(A) | 19(C) | 19(B) | 19(A) |
| Sales — net | $330,000 | $202,450 | $181,727 | 156 | 120 | 105 | $211,538 | $168,708 | $173,073 |
| Cost of goods sold | 264,000 | 161,450 | 147,527 | 167 | 135 | 117 | 158,084 | 119,593 | 126,091 |
| Gross profit | $ 66,000 | $ 41,000 | $ 34,200 | | | | $ 53,454 | $ 49,115 | $ 46,982 |
| Operating expenses: | | | | | | | | | |
| Salaries and wages | $ 7,700 | $ 5,400 | $ 4,500 | 236 | 208 | 193 | $ 3,263 | $ 2,596 | $ 2,332 |
| Depreciation | 1,200 | 1,100 | 1,000 | * | ** | 95 | 1,203 | 1,203 | 1,053 |
| Other expenses | 7,100 | 4,500 | 3,600 | 156 | 123 | 108 | 4,551 | 3,659 | 3,333 |
| Total operating expenses | $ 16,000 | $ 11,000 | $ 9,100 | | | | $ 9,017 | $ 7,458 | $ 6,718 |
| Net operating profit | $ 50,000 | $ 30,000 | $ 25,100 | | | | $ 44,437 | $ 41,657 | $ 40,264 |
| Other income — net | 1,700 | 1,150 | 1,000 | 156 | 120 | 105 | 1,090 | 958 | 952 |
| Net profit before Federal income taxes | $ 51,700 | $ 31,150 | $ 26,100 | | | | $ 45,527 | $ 42,615 | $ 41,216 |
| Provision for Federal income taxes | 20,000 | 12,500 | 21,000 | 156 | 120 | 105 | 12,821 | 10,417 | 20,000 |
| Net profit after taxes | $ 31,700 | $ 18,650 | $ 5,100 | | | | $ 32,706 | $ 32,198 | $ 21,216 |
| Loss due to purchase of assets at inflationary prices | ..... | ..... | ..... | | | | 16,245 | 22,456 | 18,478 |
| Net profit carried to earned surplus | $ 31,700 | $ 18,650 | $ 5,100 | | | | $ 16,461 | $ 9,742 | $ 2,738 |
| Earned surplus: | | | | | | | | | |
| Balance — beginning of year | 43,870 | 29,220 | 28,180 | | | | 10,628 | 4,219 | 5,348 |
| Total | $ 75,570 | $ 47,870 | $ 33,280 | | | | $ 27,089 | $ 13,961 | $ 8,086 |
| Dividends declared | 11,570 | 4,000 | 4,060 | 156 | 120 | 105 | 7,417 | 3,333 | 3,867 |
| Balance — end of year | $ 64,000 | $ 43,870 | $ 29,220 | | | | $ 19,672 | $ 10,628 | $ 4,219 |

* $1,000 at 95, $200 at 133.

** $1,000 at 95, $100 at 133.

vated to the status of an instrument of truth for its own sake, then it must deal with realities and not take refuge in the symbols." [22] As a part of his analysis, this writer makes a distinction between financial, economic, and social accounting; the first is constructed on the fundamental notion that the equity capital in a business enterprise requires protecting in terms of nominal money units. Economic accounting, on the other hand, concentrates its attention on the ability of the firm to produce products or render services consistently over a long period of time. Finally, social accounting is concerned with the maintenance of a stable national economy. Since these three types of accounting require different data for judging their accomplishments, this English authority recommends a three-part income statement.[23]

The first part of the suggested income statement would be concerned with the income from normal operations of the firm expressed in unadjusted dollar amounts based on original cost. This "operational income," as it is called, should be capable of a sharp definition and interpretation by both accountants and economists; it should not have the wide variety of meanings and representations which currently are in vogue.

The second section of the income statement should contain what are styled "policy adjustment reserves." In this part of the statement the accountant's and the economist's explanation of individual business enterprise income would be fully reconciled and rationalized in terms of money. In other words, the policy adjustments would include all items on the income sheet (1) purporting to give recognition to the changes in the value of money, (2) relating to the maintenance of the relative competitive position of the firm, (3) giving effect to imputed costs such as interest on invested capital and wages of owners, and (4) representing equalizing of reported income, or the smoothing of dividend payments. If a business unit desired to use the base stock method of inventory pricing, for example, the accompanying reserve adjustments would be presented in this second section of the income statement. Also, all estimates of the effect of movements in the price level on the economic concept of capital maintenance would be presented in part two by retentions or releases of monetary sums as circumstances dictate. In this latter connection, the sponsor of this alternative to full stabilized accounting cautiously suggests that a supplementary valuation of plant and equipment could possibly be presented on the balance sheet; the historical cost figures could be adjusted in terms of a fraction consisting of a general index of prices at the date at which the balance sheet is prepared and an identical type of general price index

[22] Bray, 12 *Accountants' Digest* 272.
[23] Bray, F. S., *Precision and Design in Accountancy* (London: Gee and Co., Ltd., 1947), pp. 56–58.

for the time the plant item was originally acquired. In this way, the economist would be furnished data which he needs for judging depreciation policy and the maintenance of purchasing-power business capital.

The third section of the income statement would consist of an analysis of earned surplus in the form now commonly found on statements which combine the income and earned surplus data. This section would reflect, therefore, transactions relating to dividends, treasury stock, earned surplus appropriations, quasi-reorganization adjustments, etc.

The three-part income statement suggested above would offer opportunity for the accountant to present information which would be helpful to both business managements and their advisers, as well as to the economists who are interested in long-range planning of industry output. Persons concerned with evaluating the state of the national economy would also be aided if three-part income statements were regularly prepared in the ways recommended above. Such statements might also offer a possible reconciliation of the present wide-apart views as to the concept of business income.[24]

**Special capital reserve method.** This technique has been suggested as a tentative proposal for adoption by railroads, public utilities, and industrial establishments having large depreciation amounts in relation to other expenses.[25] The proposal involves the setting up of two Reserves for Depreciation; the first one would be based on past cost while the other would be adjusted for variations in the real purchasing power of the dollar. The title suggested for the second is "Special Capital Reserve for Increase in Replacement Costs." The objectives of the proposal are somewhat the same as those of the other alternatives to stabilized accounting discussed in this chapter, namely: (1) the stating of the business revenue and the expense of obtaining that revenue in homogeneous units having similar purchasing power, and (2) the association of the cause and effect occasioned by rising price levels in such a manner as to place the brunt of the loss due to money value decline on investments in physical plant items.

The supporter of this method recommends that the special Capital Reserve account be credited with an amount each fiscal period sufficiently large to take care of changes in the purchasing power of the dollars invested in the tangible capital assets. But suppose at some future date the replacement cost of the assets declines to a figure below original cost. This condition would call for a credit to periodic revenue and a charge to the Special Reserve account, until the latter account is reduced to zero. Subsequently, if prices continue to fall, the charge for depreciation would still

[24] Bailey, 26 *Harvard Business Review* 684.
[25] May, G. O., *Business Income and Price Levels* (New York: American Institute of Accountants, 1949), pp. 66–69.

be based on cost, with a further adjustment for the decline in replacement cost being credited to "operating cost" and debited to Earned Surplus account. The net effect of this (in periods of declining prices) is that revenues might not be charged with the full original cost of the plant and equipment. It is granted that this possible outcome of the use of the method is not altogether consistent, but it may be supported on the same grounds as the rule of cost or market, whichever is lower.

In summary, it may be noted that this alternative to stabilized accounting has as its technical goal the reporting of the annual income of a firm in terms of the purchasing power of the money of that same twelve-month period. The proposal does *not* contemplate the expressing of the revenue and expenses for a term of years in monetary units of substantially the same buying power.

**Summary.** Other alternative methods to stabilized accounting have been suggested [26] but the limitation of space precludes a complete discussion of their specific applications. Enough has been presented in previous sections of this chapter to indicate that accountants have certainly been seriously considering the problems posed by changes in price levels. It should be pointed out, however, that no one methodology has had wide adoption. In fact, most of the "adjusting" to current price levels has been carried on in a most informal manner. If the purchasing power of money continues to fluctuate in the future, it is likely that some practical formalization of the index number adjustment technique will be worked out which will be acceptable to most parties concerned. So long as accounting is essentially utilitarian, there will be persons striving to remove present imperfections; out of the several plans already suggested it should be possible to find one which will meet the approval of all interested groups.[27]

[26] McAnly-Sunley, 15 *Controller* 509; Engelmann, 84 *Journal of Accountancy* 456; Moonitz, 25 *Accounting Review* 137; Sanders, 85 *Journal of Accountancy* 64.

[27] See especially Lanham, 89 *Journal of Accountancy* 519.

# APPENDIX A

## Coded Bibliography

Complete reference data on books and monographs to which references are made in only one chapter of this volume have been given in the first footnote mentioning these references, with *op. cit.* used in the other footnotes. To conserve space, books and monographs to which references are made in more than one chapter of this volume are given in the bibliography below. The codes used in the footnotes uniformly identify the specific volumes by giving the year of copyright, name of author, and page number.

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# APPENDIX B

## Compound Interest and Annuity Tables

These tables have been selected from W. L. Hart's *Mathematics of Investment, Third Edition*, published by D. C. Heath and Company, Boston. They are used here by permission of the author.


| | |
|---|---|
| Compound Amount of 1 | 578 |
| Present Value of 1 | 586 |
| Amount of Annuity of 1 per Period | 598 |
| Present Value of Annuity of 1 per Period | 606 |
| Values of $(1 + i)^{\frac{1}{p}}$ | 614 |

## COMPOUND AMOUNT OF 1

$$(1 + i)^n$$

| $n$ | $\frac{1}{4}\%$ | $\frac{7}{24}\%$ | $\frac{1}{3}\%$ | $\frac{3}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 1.0025 0000 | 1.0029 1667 | 1.0033 3333 | 1.0037 5000 | 1 |
| 2 | 1.0050 0625 | 1.0058 4184 | 1.0066 7778 | 1.0075 1406 | 2 |
| 3 | 1.0075 1877 | 1.0087 7555 | 1.0100 3337 | 1.0112 9224 | 3 |
| 4 | 1.0100 3756 | 1.0117 1781 | 1.0134 0015 | 1.0150 8459 | 4 |
| 5 | 1.0125 6266 | 1.0146 6865 | 1.0167 7815 | 1.0188 9115 | 5 |
| 6 | 1.0150 9406 | 1.0176 2810 | 1.0201 6741 | 1.0227 1200 | 6 |
| 7 | 1.0176 3180 | 1.0205 9618 | 1.0235 6797 | 1.0265 4717 | 7 |
| 8 | 1.0201 7588 | 1.0235 7292 | 1.0269 7986 | 1.0303 9672 | 8 |
| 9 | 1.0227 2632 | 1.0265 5834 | 1.0304 0313 | 1.0342 6070 | 9 |
| 10 | 1.0252 8313 | 1.0295 5247 | 1.0338 3780 | 1.0381 3918 | 10 |
| 11 | 1.0278 4634 | 1.0325 5533 | 1.0372 8393 | 1.0420 3220 | 11 |
| 12 | 1.0304 1596 | 1.0355 6695 | 1.0407 4154 | 1.0459 3983 | 12 |
| 13 | 1.0329 9200 | 1.0385 8736 | 1.0442 1068 | 1.0498 6210 | 13 |
| 14 | 1.0355 7448 | 1.0416 1657 | 1.0476 9138 | 1.0537 9908 | 14 |
| 15 | 1.0381 6341 | 1.0446 5462 | 1.0511 8369 | 1.0577 5083 | 15 |
| 16 | 1.0407 5882 | 1.0477 0153 | 1.0546 8763 | 1.0617 1739 | 16 |
| 17 | 1.0433 6072 | 1.0507 5732 | 1.0582 0326 | 1.0656 9883 | 17 |
| 18 | 1.0459 6912 | 1.0538 2203 | 1.0617 3060 | 1.0696 9521 | 18 |
| 19 | 1.0485 8404 | 1.0568 9568 | 1.0652 6971 | 1.0737 0656 | 19 |
| 20 | 1.0512 0550 | 1.0599 7829 | 1.0688 2060 | 1.0777 3296 | 20 |
| 21 | 1.0538 3352 | 1.0630 6990 | 1.0723 8334 | 1.0817 7446 | 21 |
| 22 | 1.0564 6810 | 1.0661 7052 | 1.0759 5795 | 1.0858 3111 | 22 |
| 23 | 1.0591 0927 | 1.0692 8018 | 1.0795 4448 | 1.0899 0298 | 23 |
| 24 | 1.0617 5704 | 1.0723 9891 | 1.0831 4296 | 1.0939 9012 | 24 |
| 25 | 1.0644 1144 | 1.0755 2674 | 1.0867 5344 | 1.0980 9258 | 25 |
| 26 | 1.0670 7247 | 1.0786 6370 | 1.0903 7595 | 1.1022 1043 | 26 |
| 27 | 1.0697 4015 | 1.0818 0980 | 1.0940 1053 | 1.1063 4372 | 27 |
| 28 | 1.0724 1450 | 1.0849 6508 | 1.0976 5724 | 1.1104 9251 | 28 |
| 29 | 1.0750 9553 | 1.0881 2956 | 1.1013 1609 | 1.1146 5685 | 29 |
| 30 | 1.0777 8327 | 1.0913 0327 | 1.1049 8715 | 1.1188 3682 | 30 |
| 31 | 1.0804 7773 | 1.0944 8624 | 1.1086 7044 | 1.1230 3245 | 31 |
| 32 | 1.0831 7892 | 1.0976 7849 | 1.1123 6601 | 1.1272 4383 | 32 |
| 33 | 1.0858 8687 | 1.1008 8005 | 1.1160 7389 | 1.1314 7099 | 33 |
| 34 | 1.0886 0159 | 1.1040 9095 | 1.1197 9414 | 1.1357 1401 | 34 |
| 35 | 1.0913 2309 | 1.1073 1122 | 1.1235 2679 | 1.1399 7293 | 35 |
| 36 | 1.0940 5140 | 1.1105 4088 | 1.1272 7187 | 1.1442 4783 | 36 |
| 37 | 1.0967 8653 | 1.1137 7995 | 1.1310 2945 | 1.1485 3876 | 37 |
| 38 | 1.0995 2850 | 1.1170 2848 | 1.1347 9955 | 1.1528 4578 | 38 |
| 39 | 1.1022 7732 | 1.1202 8648 | 1.1385 8221 | 1.1571 6895 | 39 |
| 40 | 1.1050 3301 | 1.1235 5398 | 1.1423 7748 | 1.1615 0834 | 40 |
| 41 | 1.1077 9559 | 1.1268 3101 | 1.1461 8541 | 1.1658 6399 | 41 |
| 42 | 1.1105 6508 | 1.1301 1760 | 1.1500 0603 | 1.1702 3598 | 42 |
| 43 | 1.1133 4149 | 1.1334 1378 | 1.1538 3938 | 1.1746 2437 | 43 |
| 44 | 1.1161 2485 | 1.1367 1957 | 1.1576 8551 | 1.1790 2921 | 44 |
| 45 | 1.1189 1516 | 1.1400 3500 | 1.1615 4446 | 1.1834 5057 | 45 |
| 46 | 1.1217 1245 | 1.1433 6010 | 1.1654 1628 | 1.1878 8851 | 46 |
| 47 | 1.1245 1673 | 1.1466 9490 | 1.1693 0100 | 1.1923 4309 | 47 |
| 48 | 1.1273 2802 | 1.1500 3943 | 1.1731 9867 | 1.1968 1438 | 48 |
| 49 | 1.1301 4634 | 1.1533 9371 | 1.1771 0933 | 1.2013 0243 | 49 |
| 50 | 1.1329 7171 | 1.1567 5778 | 1.1810 3303 | 1.2058 0732 | 50 |

## COMPOUND AMOUNT OF 1

$$(1 + i)^n$$

| $n$ | $\frac{5}{12}\%$ | $\frac{1}{2}\%$ | $\frac{7}{12}\%$ | $\frac{5}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 1.0041 6667 | 1.0050 0000 | 1.0058 3333 | 1.0062 5000 | 1 |
| 2 | 1.0083 5069 | 1.0100 2500 | 1.0117 0069 | 1.0125 3906 | 2 |
| 3 | 1.0125 5216 | 1.0150 7513 | 1.0176 0228 | 1.0188 6743 | 3 |
| 4 | 1.0167 7112 | 1.0201 5050 | 1.0235 3830 | 1.0252 3535 | 4 |
| 5 | 1.0210 0767 | 1.0252 5125 | 1.0295 0894 | 1.0316 4307 | 5 |
| 6 | 1.0252 6187 | 1.0303 7751 | 1.0355 1440 | 1.0380 9084 | 6 |
| 7 | 1.0295 3379 | 1.0355 2940 | 1.0415 5490 | 1.0445 7891 | 7 |
| 8 | 1.0338 2352 | 1.0407 0704 | 1.0476 3064 | 1.0511 0753 | 8 |
| 9 | 1.0381 3111 | 1.0459 1058 | 1.0537 4182 | 1.0576 7695 | 9 |
| 10 | 1.0424 5666 | 1.0511 4013 | 1.0598 8865 | 1.0642 8743 | 10 |
| 11 | 1.0468 0023 | 1.0563 9583 | 1.0660 7133 | 1.0709 3923 | 11 |
| 12 | 1.0511 6190 | 1.0616 7781 | 1.0722 9008 | 1.0776 3260 | 12 |
| 13 | 1.0555 4174 | 1.0669 8620 | 1.0785 4511 | 1.0843 6780 | 13 |
| 14 | 1.0599 3983 | 1.0723 2113 | 1.0848 3662 | 1.0911 4510 | 14 |
| 15 | 1.0643 5625 | 1.0776 8274 | 1.0911 6483 | 1.0979 6476 | 15 |
| 16 | 1.0687 9106 | 1.0830 7115 | 1.0975 2996 | 1.1048 2704 | 16 |
| 17 | 1.0732 4436 | 1.0884 8651 | 1.1039 3222 | 1.1117 3221 | 17 |
| 18 | 1.0777 1621 | 1.0939 2894 | 1.1103 7182 | 1.1186 8053 | 18 |
| 19 | 1.0822 0670 | 1.0993 9858 | 1.1168 4899 | 1.1256 7229 | 19 |
| 20 | 1.0867 1589 | 1.1048 9558 | 1.1233 6395 | 1.1327 0774 | 20 |
| 21 | 1.0912 4387 | 1.1104 2006 | 1.1299 1690 | 1.1397 8716 | 21 |
| 22 | 1.0957 9072 | 1.1159 7216 | 1.1365 0808 | 1.1469 1083 | 22 |
| 23 | 1.1003 5652 | 1.1215 5202 | 1.1431 3771 | 1.1540 7902 | 23 |
| 24 | 1.1049 4134 | 1.1271 5978 | 1.1498 0602 | 1.1612 9202 | 24 |
| 25 | 1.1095 4526 | 1.1327 9558 | 1.1565 1322 | 1.1685 5009 | 25 |
| 26 | 1.1141 6836 | 1.1384 5955 | 1.1632 5955 | 1.1758 5353 | 26 |
| 27 | 1.1188 1073 | 1.1441 5185 | 1.1700 4523 | 1.1832 0262 | 27 |
| 28 | 1.1234 7244 | 1.1498 7261 | 1.1768 7049 | 1.1905 9763 | 28 |
| 29 | 1.1281 5358 | 1.1556 2197 | 1.1837 3557 | 1.1980 3887 | 29 |
| 30 | 1.1328 5422 | 1.1614 0008 | 1.1906 4069 | 1.2055 2661 | 30 |
| 31 | 1.1375 7444 | 1.1672 0708 | 1.1975 8610 | 1.2130 6115 | 31 |
| 32 | 1.1423 1434 | 1.1730 4312 | 1.2045 7202 | 1.2206 4278 | 32 |
| 33 | 1.1470 7398 | 1.1789 0833 | 1.2115 9869 | 1.2282 7180 | 33 |
| 34 | 1.1518 5346 | 1.1848 0288 | 1.2186 6634 | 1.2359 4850 | 34 |
| 35 | 1.1566 5284 | 1.1907 2689 | 1.2257 7523 | 1.2436 7318 | 35 |
| 36 | 1.1614 7223 | 1.1966 8052 | 1.2329 2559 | 1.2514 4614 | 36 |
| 37 | 1.1663 1170 | 1.2026 6393 | 1.2401 1765 | 1.2592 6767 | 37 |
| 38 | 1.1711 7133 | 1.2086 7725 | 1.2473 5167 | 1.2671 3810 | 38 |
| 39 | 1.1760 5121 | 1.2147 2063 | 1.2546 2789 | 1.2750 5771 | 39 |
| 40 | 1.1809 5142 | 1.2207 9424 | 1.2619 4655 | 1.2830 2682 | 40 |
| 41 | 1.1858 7206 | 1.2268 9821 | 1.2693 0791 | 1.2910 4574 | 41 |
| 42 | 1.1908 1319 | 1.2330 3270 | 1.2767 1220 | 1.2991 1477 | 42 |
| 43 | 1.1957 7491 | 1.2391 9786 | 1.2841 5969 | 1.3072 3424 | 43 |
| 44 | 1.2007 5731 | 1.2453 9385 | 1.2916 5062 | 1.3154 0446 | 44 |
| 45 | 1.2057 6046 | 1.2516 2082 | 1.2991 8525 | 1.3236 2573 | 45 |
| 46 | 1.2107 8446 | 1.2578 7892 | 1.3067 6383 | 1.3318 9839 | 46 |
| 47 | 1.2158 2940 | 1.2641 6832 | 1.3143 8662 | 1.3402 2276 | 47 |
| 48 | 1.2208 9536 | 1.2704 8916 | 1.3220 5388 | 1.3485 9915 | 48 |
| 49 | 1.2259 8242 | 1.2768 4161 | 1.3297 6586 | 1.3570 2790 | 49 |
| 50 | 1.2310 9068 | 1.2832 2581 | 1.3375 2283 | 1.3655 0932 | 50 |

## COMPOUND AMOUNT OF 1

$(1 + i)^n$

| $n$ | $\frac{3}{4}\%$ | $\frac{7}{8}\%$ | $1\%$ | $1\frac{1}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 1.0075 0000 | 1.0087 5000 | 1.0100 0000 | 1.0112 5000 | 1 |
| 2 | 1.0150 5625 | 1.0175 7656 | 1.0201 0000 | 1.0226 2656 | 2 |
| 3 | 1.0226 6917 | 1.0264 8036 | 1.0303 0100 | 1.0341 3111 | 3 |
| 4 | 1.0303 3919 | 1.0354 6206 | 1.0406 0401 | 1.0457 6509 | 4 |
| 5 | 1.0380 6673 | 1.0445 2235 | 1.0510 1005 | 1.0575 2994 | 5 |
| 6 | 1.0458 5224 | 1.0536 6192 | 1.0615 2015 | 1.0694 2716 | 6 |
| 7 | 1.0536 9613 | 1.0628 8147 | 1.0721 3535 | 1.0814 5821 | 7 |
| 8 | 1.0615 9885 | 1.0721 8168 | 1.0828 5671 | 1.0936 2462 | 8 |
| 9 | 1.0695 6084 | 1.0815 6327 | 1.0936 8527 | 1.1059 2789 | 9 |
| 10 | 1.0775 8255 | 1.0910 2695 | 1.1046 2213 | 1.1183 6958 | 10 |
| 11 | 1.0856 6441 | 1.1005 7343 | 1.1156 6835 | 1.1309 5124 | 11 |
| 12 | 1.0938 0690 | 1.1102 0345 | 1.1268 2503 | 1.1436 7444 | 12 |
| 13 | 1.1020 1045 | 1.1199 1773 | 1.1380 9328 | 1.1565 4078 | 13 |
| 14 | 1.1102 7553 | 1.1297 1701 | 1.1494 7421 | 1.1695 5186 | 14 |
| 15 | 1.1186 0259 | 1.1396 0203 | 1.1609 6896 | 1.1827 0932 | 15 |
| 16 | 1.1269 9211 | 1.1495 7355 | 1.1725 7864 | 1.1960 1480 | 16 |
| 17 | 1.1354 4455 | 1.1596 3232 | 1.1843 0443 | 1.2094 6997 | 17 |
| 18 | 1.1439 6039 | 1.1697 7910 | 1.1961 4748 | 1.2230 7650 | 18 |
| 19 | 1.1525 4009 | 1.1800 1467 | 1.2081 0895 | 1.2368 3611 | 19 |
| 20 | 1.1611 8414 | 1.1903 3980 | 1.2201 9004 | 1.2507 5052 | 20 |
| 21 | 1.1698 9302 | 1.2007 5527 | 1.2323 9194 | 1.2648 2146 | 21 |
| 22 | 1.1786 6722 | 1.2112 6188 | 1.2447 1586 | 1.2790 5071 | 22 |
| 23 | 1.1875 0723 | 1.2218 6042 | 1.2571 6302 | 1.2934 4003 | 23 |
| 24 | 1.1964 1353 | 1.2325 5170 | 1.2697 3465 | 1.3079 9123 | 24 |
| 25 | 1.2053 8663 | 1.2433 3653 | 1.2824 3200 | 1.3227 0613 | 25 |
| 26 | 1.2144 2703 | 1.2542 1572 | 1.2952 5631 | 1.3375 8657 | 26 |
| 27 | 1.2235 3523 | 1.2651 9011 | 1.3082 0888 | 1.3526 3442 | 27 |
| 28 | 1.2327 1175 | 1.2762 6052 | 1.3212 9097 | 1.3678 5156 | 28 |
| 29 | 1.2419 5709 | 1.2874 2780 | 1.3345 0388 | 1.3832 3989 | 29 |
| 30 | 1.2512 7176 | 1.2986 9280 | 1.3478 4892 | 1.3988 0134 | 30 |
| 31 | 1.2606 5630 | 1.3100 5636 | 1.3613 2740 | 1.4145 3785 | 31 |
| 32 | 1.2701 1122 | 1.3215 1935 | 1.3749 4068 | 1.4304 5140 | 32 |
| 33 | 1.2796 3706 | 1.3330 8265 | 1.3886 9009 | 1.4465 4398 | 33 |
| 34 | 1.2892 3434 | 1.3447 4712 | 1.4025 7699 | 1.4628 1760 | 34 |
| 35 | 1.2989 0359 | 1.3565 1366 | 1.4166 0276 | 1.4792 7430 | 35 |
| 36 | 1.3086 4537 | 1.3683 8315 | 1.4307 6878 | 1.4959 1613 | 36 |
| 37 | 1.3184 6021 | 1.3803 5650 | 1.4450 7647 | 1.5127 4519 | 37 |
| 38 | 1.3283 4866 | 1.3924 3462 | 1.4595 2724 | 1.5297 6357 | 38 |
| 39 | 1.3383 1128 | 1.4046 1843 | 1.4741 2251 | 1.5469 7341 | 39 |
| 40 | 1.3483 4861 | 1.4169 0884 | 1.4888 6373 | 1.5643 7687 | 40 |
| 41 | 1.3584 6123 | 1.4293 0679 | 1 5037 5237 | 1.5819 7611 | 41 |
| 42 | 1.3686 4969 | 1.4418 1322 | 1.5187 8989 | 1.5997 7334 | 42 |
| 43 | 1.3789 1456 | 1.4544 2909 | 1.5339 7779 | 1.6177 7079 | 43 |
| 44 | 1.3892 5642 | 1.4671 5534 | 1.5493 1757 | 1.6359 7071 | 44 |
| 45 | 1.3996 7584 | 1.4799 9295 | 1.5648 1075 | 1.6543 7538 | 45 |
| 46 | 1.4101 7341 | 1.4929 4289 | 1.5804 5885 | 1.6729 8710 | 46 |
| 47 | 1.4207 4971 | 1.5060 0614 | 1.5962 6344 | 1.6918 0821 | 47 |
| 48 | 1.4314 0533 | 1.5191 8370 | 1.6122 2608 | 1.7108 4105 | 48 |
| 49 | 1.4421 4087 | 1.5324 7655 | 1.6283 4834 | 1.7300 8801 | 49 |
| 50 | 1.4529 5693 | 1.5458 8572 | 1.6446 3182 | 1.7495 5150 | 50 |

## COMPOUND AMOUNT OF 1

$(1 + i)^n$

| $n$ | $1\frac{1}{4}\%$ | $1\frac{3}{8}\%$ | $1\frac{1}{2}\%$ | $1\frac{5}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 1.0125 0000 | 1.0137 5000 | 1.0150 0000 | 1.0162 5000 | 1 |
| 2 | 1.0251 5625 | 1.0276 8906 | 1.0302 2500 | 1.0327 6406 | 2 |
| 3 | 1.0379 7070 | 1.0418 1979 | 1.0456 7838 | 1.0495 4648 | 3 |
| 4 | 1.0509 4534 | 1.0561 4481 | 1.0613 6355 | 1.0666 0161 | 4 |
| 5 | 1.0640 8215 | 1.0706 6680 | 1.0772 8400 | 1.0839 3388 | 5 |
| 6 | 1.0773 8318 | 1.0853 8847 | 1.0934 4326 | 1.1015 4781 | 6 |
| 7 | 1.0908 5047 | 1.1003 1256 | 1.1098 4491 | 1.1194 4796 | 7 |
| 8 | 1.1044 8610 | 1.1154 4186 | 1.1264 9259 | 1.1376 3899 | 8 |
| 9 | 1.1182 9218 | 1.1307 7918 | 1.1433 8998 | 1.1561 2563 | 9 |
| 10 | 1.1322 7083 | 1.1463 2740 | 1.1605 4083 | 1.1749 1267 | 10 |
| 11 | 1.1464 2422 | 1.1620 8940 | 1.1779 4894 | 1.1940 0500 | 11 |
| 12 | 1.1607 5452 | 1.1780 6813 | 1.1956 1817 | 1.2134 0758 | 12 |
| 13 | 1.1752 6395 | 1.1942 6656 | 1.2135 5244 | 1.2331 2545 | 13 |
| 14 | 1.1899 5475 | 1.2106 8773 | 1.2317 5573 | 1.2531 6374 | 14 |
| 15 | 1.2048 2918 | 1.2273 3469 | 1.2502 3207 | 1.2735 2765 | 15 |
| 16 | 1.2198 8955 | 1.2442 1054 | 1.2689 8555 | 1.2942 2248 | 16 |
| 17 | 1.2351 3817 | 1.2613 1843 | 1.2880 2033 | 1.3152 5359 | 17 |
| 18 | 1.2505 7739 | 1.2786 6156 | 1.3073 4064 | 1.3366 2646 | 18 |
| 19 | 1.2662 0961 | 1.2962 4316 | 1.3269 5075 | 1.3583 4664 | 19 |
| 20 | 1.2820 3723 | 1.3140 6650 | 1.3468 5501 | 1.3804 1977 | 20 |
| 21 | 1.2980 6270 | 1.3321 3492 | 1.3670 5783 | 1.4028 5160 | 21 |
| 22 | 1.3142 8848 | 1.3504 5177 | 1.3875 6370 | 1.4256 4793 | 22 |
| 23 | 1.3307 1709 | 1.3690 2048 | 1.4083 7715 | 1.4488 1471 | 23 |
| 24 | 1.3473 5105 | 1.3878 4451 | 1.4295 0281 | 1.4723 5795 | 24 |
| 25 | 1.3641 9294 | 1.4069 2738 | 1.4509 4535 | 1.4962 8377 | 25 |
| 26 | 1.3812 4535 | 1.4262 7263 | 1.4727 0953 | 1.5205 9838 | 26 |
| 27 | 1.3985 1092 | 1.4458 8388 | 1.4948 0018 | 1.5453 0810 | 27 |
| 28 | 1.4159 9230 | 1.4657 6478 | 1.5172 2218 | 1.5704 1936 | 28 |
| 29 | 1.4336 9221 | 1.4859 1905 | 1.5399 8051 | 1.5959 3868 | 29 |
| 30 | 1.4516 1336 | 1.5063 5043 | 1.5630 8022 | 1.6218 7268 | 30 |
| 31 | 1.4697 5853 | 1.5270 6275 | 1.5865 2642 | 1.6482 2811 | 31 |
| 32 | 1.4881 3051 | 1.5480 5986 | 1.6103 2432 | 1.6750 1182 | 32 |
| 33 | 1.5067 3214 | 1.5693 4569 | 1.6344 7918 | 1.7022 3076 | 33 |
| 34 | 1.5255 6629 | 1.5909 2419 | 1.6589 9637 | 1.7298 9201 | 34 |
| 35 | 1.5446 3587 | 1.6127 9940 | 1.6838 8132 | 1.7580 0275 | 35 |
| 36 | 1.5639 4382 | 1.6349 7539 | 1.7091 3954 | 1.7865 7030 | 36 |
| 37 | 1.5834 9312 | 1.6574 5630 | 1.7347 7663 | 1.8156 0207 | 37 |
| 38 | 1.6032 8678 | 1.6802 4633 | 1.7607 9828 | 1.8451 0560 | 38 |
| 39 | 1.6233 2787 | 1.7033 4971 | 1.7872 1025 | 1.8750 8857 | 39 |
| 40 | 1.6436 1946 | 1.7267 7077 | 1.8140 1841 | 1.9055 5875 | 40 |
| 41 | 1.6641 6471 | 1.7505 1387 | 1.8412 2868 | 1.9365 2408 | 41 |
| 42 | 1.6849 6677 | 1.7745 8343 | 1.8688 4712 | 1.9679 9260 | 42 |
| 43 | 1.7060 2885 | 1.7989 8396 | 1.8968 7982 | 1.9999 7248 | 43 |
| 44 | 1.7273 5421 | 1.8237 1999 | 1.9253 3302 | 2.0324 7203 | 44 |
| 45 | 1.7489 4614 | 1.8487 9614 | 1.9542 1301 | 2.0654 9970 | 45 |
| 46 | 1.7708 0797 | 1.8742 1708 | 1.9835 2621 | 2.0990 6407 | 46 |
| 47 | 1.7929 4306 | 1.8999 8757 | 2.0132 7910 | 2.1331 7387 | 47 |
| 48 | 1.8153 5485 | 1.9261 1240 | 2.0434 7829 | 2.1678 3794 | 48 |
| 49 | 1.8380 4679 | 1.9525 9644 | 2.0741 3046 | 2.2030 6531 | 49 |
| 50 | 1.8610 2237 | 1.9794 4464 | 2.1052 4242 | 2.2388 6512 | 50 |

## COMPOUND AMOUNT OF 1

$$(1 + i)^n$$

| $n$ | $1\frac{3}{4}\%$ | $2\%$ | $2\frac{1}{4}\%$ | $2\frac{1}{2}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 1.0175 0000 | 1.0200 0000 | 1.0225 0000 | 1.0250 0000 | 1 |
| 2 | 1.0353 0625 | 1.0404 0000 | 1.0455 0625 | 1.0506 2500 | 2 |
| 3 | 1.0534 2411 | 1.0612 0800 | 1.0690 3014 | 1.0768 9063 | 3 |
| 4 | 1.0718 5903 | 1.0824 3216 | 1.0930 8332 | 1.1038 1289 | 4 |
| 5 | 1.0906 1656 | 1.1040 8080 | 1.1176 7769 | 1.1314 0821 | 5 |
| 6 | 1.1097 0235 | 1.1261 6242 | 1.1428 2544 | 1.1596 9342 | 6 |
| 7 | 1.1291 2215 | 1.1486 8567 | 1.1685 3901 | 1.1886 8575 | 7 |
| 8 | 1.1488 8178 | 1.1716 5938 | 1.1948 3114 | 1.2184 0290 | 8 |
| 9 | 1.1689 8721 | 1.1950 9257 | 1.2217 1484 | 1.2488 6297 | 9 |
| 10 | 1.1894 4449 | 1.2189 9442 | 1.2492 0343 | 1.2800 8454 | 10 |
| 11 | 1.2102 5977 | 1.2433 7431 | 1.2773 1050 | 1.3120 8666 | 11 |
| 12 | 1.2314 3931 | 1.2682 4179 | 1.3060 4999 | 1.3448 8882 | 12 |
| 13 | 1.2529 8950 | 1.2936 0663 | 1.3354 3611 | 1.3785 1104 | 13 |
| 14 | 1.2749 1682 | 1.3194 7876 | 1.3654 8343 | 1.4129 7382 | 14 |
| 15 | 1.2972 2786 | 1.3458 6834 | 1.3962 0680 | 1.4482 9817 | 15 |
| 16 | 1.3199 2935 | 1.3727 8571 | 1.4276 2146 | 1.4845 0562 | 16 |
| 17 | 1.3430 2811 | 1.4002 4142 | 1.4597 4294 | 1.5216 1826 | 17 |
| 18 | 1.3665 3111 | 1.4282 4625 | 1.4925 8716 | 1.5596 5872 | 18 |
| 19 | 1.3904 4540 | 1.4568 1117 | 1.5261 7037 | 1.5986 5019 | 19 |
| 20 | 1.4147 7820 | 1.4859 4740 | 1.5605 0920 | 1.6386 1644 | 20 |
| 21 | 1.4395 3681 | 1.5156 6634 | 1.5956 2066 | 1.6795 8185 | 21 |
| 22 | 1.4647 2871 | 1.5459 7967 | 1.6315 2212 | 1.7215 7140 | 22 |
| 23 | 1.4903 6146 | 1.5768 9926 | 1.6682 3137 | 1.7646 1068 | 23 |
| 24 | 1.5164 4279 | 1.6084 3725 | 1.7057 6658 | 1.8087 2595 | 24 |
| 25 | 1.5429 8054 | 1.6406 0599 | 1.7441 4632 | 1.8539 4410 | 25 |
| 26 | 1.5699 8269 | 1.6734 1811 | 1.7833 8962 | 1.9002 9270 | 26 |
| 27 | 1.5974 5739 | 1.7068 8648 | 1.8235 1588 | 1.9478 0002 | 27 |
| 28 | 1.6254 1290 | 1.7410 2421 | 1.8645 4499 | 1.9964 9502 | 28 |
| 29 | 1.6538 5762 | 1.7758 4469 | 1.9064 9725 | 2.0464 0739 | 29 |
| 30 | 1.6828 0013 | 1.8113 6158 | 1.9493 9344 | 2.0975 6758 | 30 |
| 31 | 1.7122 4913 | 1.8475 8882 | 1.9932 5479 | 2.1500 0677 | 31 |
| 32 | 1.7422 1349 | 1.8845 4059 | 2.0381 0303 | 2.2037 5694 | 32 |
| 33 | 1.7727 0223 | 1.9222 3140 | 2.0839 6034 | 2.2588 5086 | 33 |
| 34 | 1.8037 2452 | 1.9606 7603 | 2.1308 4945 | 2.3153 2213 | 34 |
| 35 | 1.8352 8970 | 1.9998 8955 | 2.1787 9356 | 2.3732 0519 | 35 |
| 36 | 1.8674 0727 | 2.0398 8734 | 2.2278 1642 | 2.4325 3532 | 36 |
| 37 | 1.9000 8689 | 2.0806 8509 | 2.2779 4229 | 2.4933 4870 | 37 |
| 38 | 1.9333 3841 | 2.1222 9879 | 2.3291 9599 | 2.5556 8242 | 38 |
| 39 | 1.9671 7184 | 2.1647 4477 | 2.3816 0290 | 2.6195 7448 | 39 |
| 40 | 2.0015 9734 | 2.2080 3966 | 2.4351 8897 | 2.6850 6384 | 40 |
| 41 | 2.0366 2530 | 2.2522 0046 | 2.4899 8072 | 2.7521 9043 | 41 |
| 42 | 2.0722 6624 | 2.2972 4447 | 2.5460 0528 | 2.8209 9520 | 42 |
| 43 | 2.1085 3090 | 2.3431 8936 | 2.6032 9040 | 2.8915 2008 | 43 |
| 44 | 2.1454 3019 | 2.3900 5314 | 2.6618 6444 | 2.9638 0808 | 44 |
| 45 | 2.1829 7522 | 2.4378 5421 | 2.7217 5639 | 3.0379 0328 | 45 |
| 46 | 2.2211 7728 | 2.4866 1129 | 2.7829 9590 | 3.1138 5086 | 46 |
| 47 | 2.2600 4789 | 2.5363 4352 | 2.8456 1331 | 3.1916 9713 | 47 |
| 48 | 2.2995 9872 | 2.5870 7039 | 2.9096 3961 | 3.2714 8956 | 48 |
| 49 | 2.3398 4170 | 2.6388 1179 | 2.9751 0650 | 3.3532 7680 | 49 |
| 50 | 2.3807 8893 | 2.6915 8803 | 3.0420 4640 | 3.4371 0872 | 50 |

## COMPOUND AMOUNT OF 1

$$(1 + i)^n$$

| $n$ | $2\frac{3}{4}\%$ | $3\%$ | $3\frac{1}{4}\%$ | $3\frac{1}{2}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 1.0275 0000 | 1.0300 0000 | 1.0325 0000 | 1.0350 0000 | 1 |
| 2 | 1.0557 5625 | 1.0609 0000 | 1.0660 5625 | 1.0712 2500 | 2 |
| 3 | 1.0847 8955 | 1.0927 2700 | 1.1007 0308 | 1.1087 1788 | 3 |
| 4 | 1.1146 2126 | 1.1255 0881 | 1.1364 7593 | 1.1475 2300 | 4 |
| 5 | 1.1452 7334 | 1.1592 7407 | 1.1734 1140 | 1.1876 8631 | 5 |
| 6 | 1.1767 6836 | 1.1940 5230 | 1.2115 4727 | 1.2292 5533 | 6 |
| 7 | 1.2091 2949 | 1.2298 7387 | 1.2509 2255 | 1.2722 7926 | 7 |
| 8 | 1.2423 8055 | 1.2667 7008 | 1.2915 7754 | 1.3168 0904 | 8 |
| 9 | 1.2765 4602 | 1.3047 7318 | 1.3335 5381 | 1.3628 9735 | 9 |
| 10 | 1.3116 5103 | 1.3439 1638 | 1.3768 9430 | 1.4105 9876 | 10 |
| 11 | 1.3477 2144 | 1.3842 3387 | 1.4216 4337 | 1.4599 6972 | 11 |
| 12 | 1.3847 8378 | 1.4257 6089 | 1.4678 4678 | 1.5110 6866 | 12 |
| 13 | 1.4228 6533 | 1.4685 3371 | 1.5155 5180 | 1.5639 5606 | 13 |
| 14 | 1.4619 9413 | 1.5125 8972 | 1.5648 0723 | 1.6186 9452 | 14 |
| 15 | 1.5021 9896 | 1.5579 6742 | 1.6156 6347 | 1.6753 4883 | 15 |
| 16 | 1.5435 0944 | 1.6047 0644 | 1.6681 7253 | 1.7339 8604 | 16 |
| 17 | 1.5859 5595 | 1.6528 4763 | 1.7223 8814 | 1.7946 7555 | 17 |
| 18 | 1.6295 6973 | 1.7024 3306 | 1.7783 6575 | 1.8574 8920 | 18 |
| 19 | 1.6743 8290 | 1.7535 0605 | 1.8361 6264 | 1.9225 0132 | 19 |
| 20 | 1.7204 2843 | 1.8061 1123 | 1.8958 3792 | 1.9897 8886 | 20 |
| 21 | 1.7677 4021 | 1.8602 9457 | 1.9574 5266 | 2.0594 3147 | 21 |
| 22 | 1.8163 5307 | 1.9161 0341 | 2.0210 6987 | 2.1315 1158 | 22 |
| 23 | 1.8663 0278 | 1.9735 8651 | 2.0867 5464 | 2.2061 1448 | 23 |
| 24 | 1.9176 2610 | 2.0327 9411 | 2.1545 7416 | 2.2833 2849 | 24 |
| 25 | 1.9703 6082 | 2.0937 7793 | 2.2245 9782 | 2.3632 4498 | 25 |
| 26 | 2.0245 4575 | 2.1565 9127 | 2.2968 9725 | 2.4459 5856 | 26 |
| 27 | 2.0802 2075 | 2.2212 8901 | 2.3715 4641 | 2.5315 6711 | 27 |
| 28 | 2.1374 2682 | 2.2879 2768 | 2.4486 2167 | 2.6201 7196 | 28 |
| 29 | 2.1962 0606 | 2.3565 6551 | 2.5282 0188 | 2.7118 7798 | 29 |
| 30 | 2.2566 0173 | 2.4272 6247 | 2.6103 6844 | 2.8067 9370 | 30 |
| 31 | 2.3186 5828 | 2.5000 8035 | 2.6952 0541 | 2.9050 3148 | 31 |
| 32 | 2.3824 2138 | 2.5750 8276 | 2.7827 9959 | 3.0067 0759 | 32 |
| 33 | 2.4479 3797 | 2.6523 3524 | 2.8732 4058 | 3.1119 4235 | 33 |
| 34 | 2.5152 5626 | 2.7319 0530 | 2.9666 2089 | 3.2208 6033 | 34 |
| 35 | 2.5844 2581 | 2.8138 6245 | 3.0630 3607 | 3.3335 9045 | 35 |
| 36 | 2.6554 9752 | 2.8982 7833 | 3.1625 8475 | 3.4502 6611 | 36 |
| 37 | 2.7285 2370 | 2.9852 2668 | 3.2653 6875 | 3.5710 2543 | 37 |
| 38 | 2.8035 5810 | 3.0747 8348 | 3.3714 9323 | 3.6960 1132 | 38 |
| 39 | 2.8806 5595 | 3.1670 2698 | 3.4810 6676 | 3.8253 7171 | 39 |
| 40 | 2.9598 7399 | 3.2620 3779 | 3.5942 0143 | 3.9592 5972 | 40 |
| 41 | 3.0412 7052 | 3.3598 9893 | 3.7110 1298 | 4.0978 3381 | 41 |
| 42 | 3.1249 0546 | 3.4606 9589 | 3.8316 2090 | 4.2412 5799 | 42 |
| 43 | 3.2108 4036 | 3.5645 1677 | 3.9561 4858 | 4.3897 0202 | 43 |
| 44 | 3.2991 3847 | 3.6714 5227 | 4.0847 2341 | 4.5433 4160 | 44 |
| 45 | 3.3898 6478 | 3.7815 9584 | 4.2174 7692 | 4.7023 5855 | 45 |
| 46 | 3.4830 8606 | 3.8950 4372 | 4.3545 4492 | 4.8669 4110 | 46 |
| 47 | 3.5788 7093 | 4.0118 9503 | 4.4960 6763 | 5.0372 8404 | 47 |
| 48 | 3.6772 8988 | 4.1322 5188 | 4.6421 8983 | 5.2135 8898 | 48 |
| 49 | 3.7784 1535 | 4.2562 1944 | 4.7930 6100 | 5.3960 6459 | 49 |
| 50 | 3.8823 2177 | 4.3839 0602 | 4.9488 3548 | 5.5849 2686 | 50 |

## COMPOUND AMOUNT OF 1

$$(1 + i)^n$$

| $n$ | 4% | 4½% | 5% | 5½% | $n$ |
|---|---|---|---|---|---|
| 1 | 1.0400 0000 | 1.0450 0000 | 1.0500 0000 | 1.0550 0000 | 1 |
| 2 | 1.0816 0000 | 1.0920 2500 | 1.1025 0000 | 1.1130 2500 | 2 |
| 3 | 1.1248 6400 | 1.1411 6613 | 1.1576 2500 | 1.1742 4138 | 3 |
| 4 | 1.1698 5856 | 1.1925 1860 | 1.2155 0625 | 1.2388 2465 | 4 |
| 5 | 1.2166 5290 | 1.2461 8194 | 1.2762 8156 | 1.3069 6001 | 5 |
| 6 | 1.2653 1902 | 1.3022 6012 | 1.3400 9564 | 1.3788 4281 | 6 |
| 7 | 1.3159 3178 | 1.3608 6183 | 1.4071 0042 | 1.4546 7916 | 7 |
| 8 | 1.3685 6905 | 1.4221 0061 | 1.4774 5544 | 1.5346 8651 | 8 |
| 9 | 1.4233 1181 | 1.4860 9514 | 1.5513 2822 | 1.6190 9427 | 9 |
| 10 | 1.4802 4428 | 1.5529 6942 | 1.6288 9463 | 1.7081 4446 | 10 |
| 11 | 1.5394 5406 | 1.6228 5305 | 1.7103 3936 | 1.8020 9240 | 11 |
| 12 | 1.6010 3222 | 1.6958 8143 | 1.7958 5633 | 1.9012 0749 | 12 |
| 13 | 1.6650 7351 | 1.7721 9610 | 1.8856 4914 | 2.0057 7390 | 13 |
| 14 | 1.7316 7645 | 1.8519 4492 | 1.9799 3160 | 2.1160 9146 | 14 |
| 15 | 1.8009 4351 | 1.9352 8244 | 2.0789 2818 | 2.2324 7649 | 15 |
| 16 | 1.8729 8125 | 2.0223 7015 | 2.1828 7459 | 2.3552 6270 | 16 |
| 17 | 1.9479 0050 | 2.1133 7681 | 2.2920 1832 | 2.4848 0215 | 17 |
| 18 | 2.0258 1652 | 2.2084 7877 | 2.4066 1923 | 2.6214 6627 | 18 |
| 19 | 2.1068 4918 | 2.3078 6031 | 2.5269 5020 | 2.7656 4691 | 19 |
| 20 | 2.1911 2314 | 2.4117 1402 | 2.6532 9771 | 2.9177 5749 | 20 |
| 21 | 2.2787 6807 | 2.5202 4116 | 2.7859 6259 | 3.0782 3415 | 21 |
| 22 | 2.3699 1879 | 2.6336 5201 | 2.9252 6072 | 3.2475 3703 | 22 |
| 23 | 2.4647 1554 | 2.7521 6635 | 3.0715 2376 | 3.4261 5157 | 23 |
| 24 | 2.5633 0416 | 2.8760 1383 | 3.2250 9994 | 3.6145 8990 | 24 |
| 25 | 2.6658 3633 | 3.0054 3446 | 3.3863 5494 | 3.8133 9235 | 25 |
| 26 | 2.7724 6978 | 3.1406 7901 | 3.5556 7269 | 4.0231 2893 | 26 |
| 27 | 2.8833 6858 | 3.2820 0956 | 3.7334 5632 | 4.2444 0102 | 27 |
| 28 | 2.9987 0332 | 3.4296 9999 | 3.9201 2914 | 4.4778 4307 | 28 |
| 29 | 3.1186 5145 | 3.5840 3649 | 4.1161 3560 | 4.7241 2444 | 29 |
| 30 | 3.2433 9751 | 3.7453 1813 | 4.3219 4238 | 4.9839 5129 | 30 |
| 31 | 3.3731 3341 | 3.9138 5745 | 4.5380 3949 | 5.2580 6861 | 31 |
| 32 | 3.5080 5875 | 4.0899 8104 | 4.7649 4147 | 5.5472 6238 | 32 |
| 33 | 3.6483 8110 | 4.2740 3018 | 5.0031 8854 | 5.8523 6181 | 33 |
| 34 | 3.7943 1634 | 4.4663 6154 | 5.2533 4797 | 6.1742 4171 | 34 |
| 35 | 3.9460 8899 | 4.6673 4781 | 5.5160 1537 | 6.5138 2501 | 35 |
| 36 | 4.1039 3255 | 4.8773 7846 | 5.7918 1614 | 6.8720 8538 | 36 |
| 37 | 4.2680 8986 | 5.0968 6049 | 6.0814 0694 | 7.2500 5008 | 37 |
| 38 | 4.4388 1345 | 5.3262 1921 | 6.3854 7729 | 7.6488 0283 | 38 |
| 39 | 4.6163 6599 | 5.5658 9908 | 6.7047 5115 | 8.0694 8699 | 39 |
| 40 | 4.8010 2063 | 5.8163 6454 | 7.0399 8871 | 8.5133 0877 | 40 |
| 41 | 4.9930 6145 | 6.0781 0094 | 7.3919 8815 | 8.9815 4076 | 41 |
| 42 | 5.1927 8391 | 6.3516 1548 | 7.7615 8756 | 9.4755 2550 | 42 |
| 43 | 5.4004 9527 | 6.6374 3818 | 8.1496 6693 | 9.9966 7940 | 43 |
| 44 | 5.6165 1508 | 6.9361 2290 | 8.5571 5028 | 10.5464 9677 | 44 |
| 45 | 5.8411 7568 | 7.2482 4843 | 8.9850 0779 | 11.1265 5409 | 45 |
| 46 | 6.0748 2271 | 7.5744 1961 | 9.4342 5818 | 11.7385 1456 | 46 |
| 47 | 6.3178 1562 | 7.9152 6849 | 9.9059 7109 | 12.3841 3287 | 47 |
| 48 | 6.5705 2824 | 8.2714 5557 | 10.4012 6965 | 13.0652 6017 | 48 |
| 49 | 6.8333 4937 | 8.6436 7107 | 10.9213 3313 | 13.7838 4948 | 49 |
| 50 | 7.1066 8335 | 9.0326 3627 | 11.4673 9979 | 14.5419 6120 | 50 |

# COMPOUND AMOUNT OF 1

$$(1 + i)^n$$

| $n$ | 6% | 6½% | 7% | 8% | $n$ |
|---|---|---|---|---|---|
| 1 | 1.0600 0000 | 1.0650 0000 | 1.0700 0000 | 1.0800 0000 | 1 |
| 2 | 1.1236 0000 | 1.1342 2500 | 1.1449 0000 | 1.1664 0000 | 2 |
| 3 | 1.1910 1600 | 1.2079 4963 | 1.2250 4300 | 1.2597 1200 | 3 |
| 4 | 1.2624 7696 | 1.2864 6635 | 1.3107 9601 | 1.3604 8896 | 4 |
| 5 | 1.3382 2558 | 1.3700 8666 | 1.4025 5173 | 1.4693 2808 | 5 |
| 6 | 1.4185 1911 | 1.4591 4230 | 1.5007 3035 | 1.5868 7432 | 6 |
| 7 | 1.5036 3026 | 1.5539 8655 | 1.6057 8148 | 1.7138 2427 | 7 |
| 8 | 1.5938 4807 | 1.6549 9567 | 1.7181 8618 | 1.8509 3021 | 8 |
| 9 | 1.6894 7896 | 1.7625 7039 | 1.8384 5921 | 1.9990 0463 | 9 |
| 10 | 1.7908 4770 | 1.8771 3747 | 1.9671 5136 | 2.1589 2500 | 10 |
| 11 | 1.8982 9856 | 1.9991 5140 | 2.1048 5195 | 2.3316 3900 | 11 |
| 12 | 2.0121 9647 | 2.1290 9624 | 2.2521 9159 | 2.5181 7012 | 12 |
| 13 | 2.1329 2826 | 2.2674 8750 | 2.4098 4500 | 2.7196 2373 | 13 |
| 14 | 2.2609 0396 | 2.4148 7418 | 2.5785 3415 | 2.9371 9362 | 14 |
| 15 | 2.3965 5819 | 2.5718 4101 | 2.7590 3154 | 3.1721 6911 | 15 |
| 16 | 2.5403 5168 | 2.7390 1067 | 2.9521 6375 | 3.4259 4264 | 16 |
| 17 | 2.6927 7279 | 2.9170 4637 | 3.1588 1521 | 3.7000 1805 | 17 |
| 18 | 2.8543 3915 | 3.1066 5438 | 3.3799 3228 | 3.9960 1950 | 18 |
| 19 | 3.0255 9950 | 3.3085 8691 | 3.6165 2754 | 4.3157 0106 | 19 |
| 20 | 3.2071 3547 | 3.5236 4506 | 3.8696 8446 | 4.6609 5714 | 20 |
| 21 | 3.3995 6360 | 3.7526 8199 | 4.1405 6237 | 5.0338 3372 | 21 |
| 22 | 3.6035 3742 | 3.9966 0632 | 4.4304 0174 | 5.4365 4041 | 22 |
| 23 | 3.8197 4966 | 4.2563 8573 | 4.7405 2986 | 5.8714 6365 | 23 |
| 24 | 4.0489 3464 | 4.5330 5081 | 5.0723 6695 | 6.3411 8074 | 24 |
| 25 | 4.2918 7072 | 4.8276 9911 | 5.4274 3264 | 6.8484 7520 | 25 |
| 26 | 4.5493 8296 | 5.1414 9955 | 5.8073 5292 | 7.3963 5321 | 26 |
| 27 | 4.8223 4594 | 5.4756 9702 | 6.2138 6763 | 7.9880 6147 | 27 |
| 28 | 5.1116 8670 | 5.8316 1733 | 6.6488 3836 | 8.6271 0639 | 28 |
| 29 | 5.4183 8790 | 6.2106 7245 | 7.1142 5705 | 9.3172 7490 | 29 |
| 30 | 5.7434 9117 | 6.6143 6616 | 7.6122 5504 | 10.0626 5689 | 30 |
| 31 | 6.0881 0064 | 7.0442 9996 | 8.1451 1290 | 10.8676 6944 | 31 |
| 32 | 6.4533 8668 | 7.5021 7946 | 8.7152 7080 | 11.7370 8300 | 32 |
| 33 | 6.8405 8988 | 7.9898 2113 | 9.3253 3975 | 12.6760 4964 | 33 |
| 34 | 7.2510 2528 | 8.5091 5950 | 9.9781 1354 | 13.6901 3361 | 34 |
| 35 | 7.6860 8679 | 9.0622 5487 | 10.6765 8148 | 14.7853 4429 | 35 |
| 36 | 8.1472 5200 | 9.6513 0143 | 11.4239 4219 | 15.9681 7184 | 36 |
| 37 | 8.6360 8712 | 10.2786 3603 | 12.2236 1814 | 17.2456 2558 | 37 |
| 38 | 9.1542 5235 | 10.9467 4737 | 13.0792 7141 | 18.6252 7563 | 38 |
| 39 | 9.7035 0749 | 11.6582 8595 | 13.9948 2041 | 20.1152 9768 | 39 |
| 40 | 10.2857 1794 | 12.4160 7453 | 14.9744 5784 | 21.7245 2150 | 40 |
| 41 | 10.9028 6101 | 13.2231 1938 | 16.0226 6989 | 23.4624 8322 | 41 |
| 42 | 11.5570 3267 | 14.0826 2214 | 17.1442 5678 | 25.3394 8187 | 42 |
| 43 | 12.2504 5463 | 14.9979 9258 | 18.3443 5475 | 27.3666 4042 | 43 |
| 44 | 12.9854 8191 | 15.9728 6209 | 19.6284 5959 | 29.5559 7166 | 44 |
| 45 | 13.7646 1083 | 17.0110 9813 | 21.0024 5176 | 31.9204 4939 | 45 |
| 46 | 14.5904 8748 | 18.1168 1951 | 22.4726 2338 | 34.4740 8534 | 46 |
| 47 | 15.4659 1673 | 19.2944 1278 | 24.0457 0702 | 37.2320 1217 | 47 |
| 48 | 16.3938 7173 | 20.5485 4961 | 25.7289 0651 | 40.2105 7314 | 48 |
| 49 | 17.3775 0403 | 21.8842 0533 | 27.5299 2997 | 43.4274 1899 | 49 |
| 50 | 18.4201 5427 | 23.3066 7868 | 29.4570 2506 | 46.9016 1251 | 50 |

## PRESENT VALUE OF 1

$$v^n = (1 + i)^{-n}$$

| $n$ | $\frac{1}{4}\%$ | $\frac{7}{24}\%$ | $\frac{1}{3}\%$ | $\frac{3}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 0.9975 0623 | 0.9970 9182 | 0.9966 7774 | 0.9962 6401 | 1 |
| 2 | 0.9950 1869 | 0.9941 9209 | 0.9933 6652 | 0.9925 4198 | 2 |
| 3 | 0.9925 3734 | 0.9913 0079 | 0.9900 6630 | 0.9888 3385 | 3 |
| 4 | 0.9900 6219 | 0.9884 1791 | 0.9867 7704 | 0.9851 3958 | 4 |
| 5 | 0.9875 9321 | 0.9855 4341 | 0.9834 9871 | 0.9814 5911 | 5 |
| 6 | 0.9851 3038 | 0.9826 7727 | 0.9802 3127 | 0.9777 9238 | 6 |
| 7 | 0.9826 7370 | 0.9798 1946 | 0.9769 7469 | 0.9741 3936 | 7 |
| 8 | 0.9802 2314 | 0.9769 6996 | 0.9737 2893 | 0.9704 9999 | 8 |
| 9 | 0.9777 7869 | 0.9741 2875 | 0 9704 9395 | 0.9668 7421 | 9 |
| 10 | 0.9753 4034 | 0.9712 9581 | 0.9672 6972 | 0.9632 6198 | 10 |
| 11 | 0.9729 0807 | 0.9684 7110 | 0.9640 5620 | 0.9596 6324 | 11 |
| 12 | 0.9704 8187 | 0.9656 5461 | 0.9608 5335 | 0.9560 7795 | 12 |
| 13 | 0.9680 6171 | 0.9628 4631 | 0.9576 6115 | 0.9525 0605 | 13 |
| 14 | 0.9656 4759 | 0.9600 4617 | 0.9544 7955 | 0.9489 4750 | 14 |
| 15 | 0.9632 3949 | 0.9572 5418 | 0.9513 0852 | 0.9454 0224 | 15 |
| 16 | 0.9608 3740 | 0.9544 7031 | 0.9481 4803 | 0.9418 7022 | 16 |
| 17 | 0.9584 4130 | 0.9516 9453 | 0.9449 9803 | 0.9383 5141 | 17 |
| 18 | 0.9560 5117 | 0.9489 2683 | 0.9418 5851 | 0.9348 4573 | 18 |
| 19 | 0.9536 6700 | 0.9461 6718 | 0.9387 2941 | 0.9313 5316 | 19 |
| 20 | 0.9512 8878 | 0.9434 1555 | 0.9356 1071 | 0.9278 7363 | 20 |
| 21 | 0.9489 1649 | 0.9406 7192 | 0.9325 0236 | 0.9244 0711 | 21 |
| 22 | 0.9465 5011 | 0.9379 3627 | 0.9294 0435 | 0.9209 5353 | 22 |
| 23 | 0.9441 8964 | 0.9352 0858 | 0.9263 1663 | 0.9175 1286 | 23 |
| 24 | 0.9418 3505 | 0.9324 8882 | 0.9232 3916 | 0.9140 8504 | 24 |
| 25 | 0.9394 8634 | 0.9297 7697 | 0.9201 7192 | 0.9106 7003 | 25 |
| 26 | 0.9371 4348 | 0.9270 7301 | 0.9171 1487 | 0.9072 6777 | 26 |
| 27 | 0.9348 0646 | 0.9243 7691 | 0.9140 6798 | 0.9038 7823 | 27 |
| 28 | 0.9324 7527 | 0.9216 8865 | 0.9110 3121 | 0.9005 0135 | 28 |
| 29 | 0.9301 4990 | 0.9190 0821 | 0.9080 0453 | 0.8971 3709 | 29 |
| 30 | 0.9278 3032 | 0.9163 3557 | 0.9049 8790 | 0.8937 8539 | 30 |
| 31 | 0.9255 1653 | 0.9136 7069 | 0.9019 8130 | 0.8904 4622 | 31 |
| 32 | 0.9232 0851 | 0.9110 1357 | 0.8989 8468 | 0.8871 1952 | 32 |
| 33 | 0.9209 0624 | 0.9083 6417 | 0.8959 9802 | 0.8838 0525 | 33 |
| 34 | 0.9186 0972 | 0.9057 2248 | 0.8930 2128 | 0.8805 0336 | 34 |
| 35 | 0.9163 1892 | 0.9030 8848 | 0.8900 5444 | 0.8772 1381 | 35 |
| 36 | 0.9140 3384 | 0.9004 6213 | 0.8870 9745 | 0.8739 3655 | 36 |
| 37 | 0.9117 5445 | 0.8978 4342 | 0.8841 5028 | 0.8706 7153 | 37 |
| 38 | 0.9094 8075 | 0.8952 3232 | 0.8812 1290 | 0.8674 1871 | 38 |
| 39 | 0.9072 1272 | 0.8926 2882 | 0.8782 8528 | 0.8641 7804 | 39 |
| 40 | 0.9049 5034 | 0.8900 3289 | 0.8753 6739 | 0.8609 4948 | 40 |
| 41 | 0.9026 9361 | 0.8874 4451 | 0.8724 5920 | 0.8577 3298 | 41 |
| 42 | 0.9004 4250 | 0.8848 6366 | 0.8695 6066 | 0.8545 2850 | 42 |
| 43 | 0.8981 9701 | 0.8822 9031 | 0.8666 7175 | 0.8513 3899 | 43 |
| 44 | 0.8959 5712 | 0.8797 2445 | 0.8637 9245 | 0.8481 5541 | 44 |
| 45 | 0.8937 2281 | 0.8771 6605 | 0.8609 2270 | 0.8449 8671 | 45 |
| 46 | 0.8914 9407 | 0.8746 1509 | 0.8580 6249 | 0.8418 2985 | 46 |
| 47 | 0.8892 7090 | 0.8720 7155 | 0.8552 1179 | 0.8386 8478 | 47 |
| 48 | 0.8870 5326 | 0.8695 3540 | 0.8523 7055 | 0.8355 5146 | 48 |
| 49 | 0.8848 4116 | 0.8670 0663 | 0.8495 3876 | 0.8324 2985 | 49 |
| 50 | 0.8826 3457 | 0.8644 8522 | 0.8467 1637 | 0.8293 1990 | 50 |

## PRESENT VALUE OF 1

$$v^n = (1 + i)^{-n}$$

| $n$ | $\frac{1}{4}\%$ | $\frac{7}{24}\%$ | $\frac{1}{3}\%$ | $\frac{3}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 51 | 0.8804 3349 | 0.8619 7114 | 0.8439 0336 | 0.8262 2157 | 51 |
| 52 | 0.8782 3790 | 0.8594 6436 | 0.8410 9969 | 0.8231 3481 | 52 |
| 53 | 0.8760 4778 | 0.8569 6488 | 0.8383 0534 | 0.8200 5959 | 53 |
| 54 | 0.8738 6312 | 0.8544 7267 | 0.8355 2027 | 0.8169 9585 | 54 |
| 55 | 0.8716 8391 | 0.8519 8771 | 0.8327 4446 | 0.8139 4357 | 55 |
| 56 | 0.8695 1013 | 0.8495 0997 | 0.8299 7787 | 0.8109 0268 | 56 |
| 57 | 0.8673 4178 | 0.8470 3944 | 0.8272 2047 | 0.8078 7316 | 57 |
| 58 | 0.8651 7883 | 0.8445 7609 | 0.8244 7222 | 0.8048 5495 | 58 |
| 59 | 0.8630 2128 | 0.8421 1991 | 0.8217 3311 | 0.8018 4802 | 59 |
| 60 | 0.8608 6911 | 0.8396 7087 | 0.8190 0310 | 0.7988 5232 | 60 |
| 61 | 0.8587 2230 | 0.8372 2895 | 0.8162 8216 | 0.7958 6782 | 61 |
| 62 | 0.8565 8085 | 0.8347 9413 | 0.8135 7026 | 0.7928 9447 | 62 |
| 63 | 0.8544 4474 | 0.8323 6640 | 0.8108 6737 | 0.7899 3222 | 63 |
| 64 | 0.8523 1395 | 0.8299 4572 | 0.8081 7346 | 0.7869 8104 | 64 |
| 65 | 0.8501 8848 | 0.8275 3209 | 0.8054 8850 | 0.7840 4089 | 65 |
| 66 | 0.8480 6831 | 0.8251 2547 | 0.8028 1246 | 0.7811 1172 | 66 |
| 67 | 0.8459 5343 | 0.8227 2586 | 0.8001 4531 | 0.7781 9349 | 67 |
| 68 | 0.8438 4382 | 0.8203 3322 | 0.7974 8702 | 0.7752 8617 | 68 |
| 69 | 0.3417 3947 | 0.8179 4754 | 0.7948 3756 | 0.7723 8971 | 69 |
| 70 | 0.8396 4037 | 0.8155 6879 | 0.7921 9690 | 0.7695 0407 | 70 |
| 71 | 0.8375 4650 | 0.8131 9697 | 0.7895 6502 | 0.7666 2921 | 71 |
| 72 | 0.8354 5786 | 0.8108 3204 | 0.7869 4188 | 0.7637 6509 | 72 |
| 73 | 0.8333 7442 | 0.8084 7399 | 0 7843 2745 | 0.7609 1167 | 73 |
| 74 | 0.8312 9618 | 0.8061 2280 | 0.7817 2171 | 0.7580 6891 | 74 |
| 75 | 0.8292 2312 | 0.8037 7845 | 0.7791 2463 | 0.7552 3677 | 75 |
| 76 | 0.8271 5523 | 0.8014 4091 | 0.7765 3618 | 0.7524 1522 | 76 |
| 77 | 0.8250 9250 | 0.7991 1018 | 0.7739 5632 | 0.7496 0420 | 77 |
| 78 | 0.8230 3491 | 0.7967 8622 | 0.7713 8504 | 0.7468 0369 | 78 |
| 79 | 0.8209 8246 | 0.7944 6901 | 0.7688 2230 | 0.7440 1364 | 79 |
| 80 | 0.8189 3512 | 0.7921 5855 | 0.7662 6807 | 0.7412 3401 | 80 |
| 81 | 0.8168 9289 | 0.7898 5481 | 0.7637 2233 | 0.7384 6477 | 81 |
| 82 | 0.8148 5575 | 0.7875 5776 | 0.7611 8505 | 0.7357 0587 | 82 |
| 83 | 0.8128 2369 | 0.7852 6740 | 0.7586 5619 | 0.7329 5728 | 83 |
| 84 | 0.8107 9670 | 0.7829 8370 | 0.7561 3574 | 0.7302 1896 | 84 |
| 85 | 0.8087 7476 | 0.7807 0664 | 0.7536 2366 | 0.7274 9087 | 85 |
| 86 | 0.8067 5787 | 0.7784 3620 | 0.7511 1993 | 0.7247 7297 | 86 |
| 87 | 0.8047 4600 | 0.7761 7236 | 0.7486 2451 | 0.7220 6522 | 87 |
| 88 | 0.8027 3915 | 0.7739 1511 | 0.7461 3739 | 0.7193 6760 | 88 |
| 89 | 0.8007 3731 | 0.7716 6442 | 0.7436 5853 | 0.7166 8005 | 89 |
| 90 | 0.7987 4046 | 0.7694 2028 | 0.7411 8790 | 0.7140 0254 | 90 |
| 91 | 0.7967 4859 | 0.7671 8266 | 0.7387 2548 | 0.7113 3503 | 91 |
| 92 | 0.7947 6168 | 0.7649 5156 | 0.7362 7125 | 0.7086 7749 | 92 |
| 93 | 0.7927 7973 | 0.7627 2694 | 0.7338 2516 | 0.7060 2988 | 93 |
| 94 | 0.7908 0273 | 0.7605 0878 | 0.7313 8720 | 0.7033 9216 | 94 |
| 95 | 0.7888 3065 | 0.7582 9708 | 0.7289 5735 | 0.7007 6429 | 95 |
| 96 | 0.7868 6349 | 0.7560 9182 | 0.7265 3556 | 0.6981 4624 | 96 |
| 97 | 0.7849 0124 | 0.7538 9296 | 0.7241 2182 | 0.6955 3797 | 97 |
| 98 | 0.7829 4388 | 0.7517 0050 | 0.7217 1610 | 0.6929 3945 | 98 |
| 99 | 0.7809 9140 | 0.7495 1442 | 0.7193 1837 | 0.6903 5064 | 99 |
| 100 | 0.7790 4379 | 0.7473 3469 | 0.7169 2861 | 0.6877 7149 | 100 |

## PRESENT VALUE OF 1

$$v^n = (1 + i)^{-n}$$

| $n$ | $\frac{5}{12}\%$ | $\frac{1}{2}\%$ | $\frac{7}{12}\%$ | $\frac{5}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 0.9958 5062 | 0.9950 2488 | 0.9942 0050 | 0.9937 8882 | 1 |
| 2 | 0.9917 1846 | 0.9900 7450 | 0.9884 3463 | 0.9876 1622 | 2 |
| 3 | 0.9876 0345 | 0.9851 4876 | 0.9827 0220 | 0.9814 8196 | 3 |
| 4 | 0.9835 0551 | 0.9802 4752 | 0.9770 0301 | 0.9753 8580 | 4 |
| 5 | 0.9794 2457 | 0.9753 7067 | 0.9713 3688 | 0.9693 2750 | 5 |
| 6 | 0.9753 6057 | 0.9705 1808 | 0.9657 0361 | 0.9633 0683 | 6 |
| 7 | 0.9713 1343 | 0.9656 8963 | 0.9601 0301 | 0.9573 2356 | 7 |
| 8 | 0.9672 8308 | 0.9608 8520 | 0.9545 3489 | 0.9513 7745 | 8 |
| 9 | 0.9632 6946 | 0.9561 0468 | 0.9489 9906 | 0.9454 6827 | 9 |
| 10 | 0.9592 7249 | 0.9513 4794 | 0.9434 9534 | 0.9395 9580 | 10 |
| 11 | 0.9552 9211 | 0.9466 1487 | 0.9380 2354 | 0.9337 5980 | 11 |
| 12 | 0.9513 2824 | 0.9419 0534 | 0.9325 8347 | 0.9279 6005 | 12 |
| 13 | 0.9473 8082 | 0.9372 1924 | 0.9271 7495 | 0.9221 9632 | 13 |
| 14 | 0.9434 4978 | 0.9325 5646 | 0.9217 9779 | 0.9164 6840 | 14 |
| 15 | 0.9395 3505 | 0.9279 1688 | 0.9164 5182 | 0.9107 7604 | 15 |
| 16 | 0.9356 3657 | 0.9233 0037 | 0.9111 3686 | 0.9051 1905 | 16 |
| 17 | 0.9317 5426 | 0.9187 0684 | 0.9058 5272 | 0.8994 9719 | 17 |
| 18 | 0.9278 8806 | 0.9141 3616 | 0.9005 9922 | 0.8939 1025 | 18 |
| 19 | 0.9240 3790 | 0.9095 8822 | 0.8953 7619 | 0.8883 5802 | 19 |
| 20 | 0.9202 0372 | 0.9050 6290 | 0.8901 8346 | 0.8828 4027 | 20 |
| 21 | 0.9163 8544 | 0.9005 6010 | 0.8850 2084 | 0.8773 5679 | 21 |
| 22 | 0.9125 8301 | 0.8960 7971 | 0.8798 8815 | 0.8719 0736 | 22 |
| 23 | 0.9087 9636 | 0.8916 2160 | 0.8747 8524 | 0.8664 9179 | 23 |
| 24 | 0.9050 2542 | 0.8871 8567 | 0.8697 1192 | 0.8611 0985 | 24 |
| 25 | 0.9012 7013 | 0.8827 7181 | 0.8646 6802 | 0.8557 6135 | 25 |
| 26 | 0.8975 3042 | 0.8783 7991 | 0.8596 5338 | 0.8504 4606 | 26 |
| 27 | 0.8938 0623 | 0.8740 0986 | 0.8546 6782 | 0.8451 6378 | 27 |
| 28 | 0.8900 9749 | 0.8696 6155 | 0.8497 1117 | 0.8399 1432 | 28 |
| 29 | 0.8864 0414 | 0.8653 3488 | 0.8447 8327 | 0.8346 9746 | 29 |
| 30 | 0.8827 2611 | 0.8610 2973 | 0.8398 8394 | 0.8295 1300 | 30 |
| 31 | 0.8790 6335 | 0.8567 4600 | 0.8350 1303 | 0.8243 6075 | 31 |
| 32 | 0.8754 1578 | 0.8524 8358 | 0.8301 7037 | 0.8192 4050 | 32 |
| 33 | 0.8717 8335 | 0.8482 4237 | 0.8253 5580 | 0.8141 5205 | 33 |
| 34 | 0.8681 6599 | 0.8440 2226 | 0.8205 6914 | 0.8090 9520 | 34 |
| 35 | 0.8645 6365 | 0.8398 2314 | 0.8158 1025 | 0.8040 6976 | 35 |
| 36 | 0.8609 7624 | 0.8356 4492 | 0.8110 7896 | 0.7990 7554 | 36 |
| 37 | 0.8574 0373 | 0.8314 8748 | 0.8063 7510 | 0.7941 1234 | 37 |
| 38 | 0.8538 4604 | 0.8273 5073 | 0.8016 9853 | 0.7891 7997 | 38 |
| 39 | 0.8503 0311 | 0.8232 3455 | 0.7970 4907 | 0.7842 7823 | 39 |
| 40 | 0.8467 7488 | 0.8191 3886 | 0.7924 2659 | 0.7794 0693 | 40 |
| 41 | 0.8432 6129 | 0.8150 6354 | 0.7878 3091 | 0.7745 6590 | 41 |
| 42 | 0.8397 6228 | 0.8110 0850 | 0.7832 6188 | 0.7697 5493 | 42 |
| 43 | 0.8362 7779 | 0.8069 7363 | 0.7787 1935 | 0.7649 7384 | 43 |
| 44 | 0.8328 0776 | 0.8029 5884 | 0.7742 0316 | 0.7602 2245 | 44 |
| 45 | 0.8293 5212 | 0.7989 6402 | 0.7697 1317 | 0.7555 0057 | 45 |
| 46 | 0.8259 1083 | 0.7949 8907 | 0.7652 4922 | 0.7508 0802 | 46 |
| 47 | 0.8224 8381 | 0.7910 3390 | 0.7608 1115 | 0.7461 4462 | 47 |
| 48 | 0.8190 7102 | 0.7870 9841 | 0.7563 9883 | 0.7415 1018 | 48 |
| 49 | 0.8156 7238 | 0.7831 8250 | 0.7520 1209 | 0.7369 0453 | 49 |
| 50 | 0.8122 8785 | 0.7792 8607 | 0.7476 5079 | 0.7323 2748 | 50 |

## PRESENT VALUE OF 1

$$v^n = (1 + i)^{-n}$$

| $n$ | $\frac{5}{12}\%$ | $\frac{1}{2}\%$ | $\frac{7}{12}\%$ | $\frac{5}{6}\%$ | $n$ |
|---|---|---|---|---|---|
| 51 | 0.8089 1736 | 0.7754 0902 | 0.7433 1479 | 0.7277 7886 | 51 |
| 52 | 0.8055 6086 | 0.7715 5127 | 0.7390 0393 | 0.7222 5849 | 52 |
| 53 | 0.8022 1828 | 0.7677 1270 | 0.7347 1808 | 0.7187 6620 | 53 |
| 54 | 0.7988 8957 | 0.7638 9324 | 0.7304 5708 | 0.7143 0182 | 54 |
| 55 | 0.7955 7468 | 0.7600 9277 | 0.7262 2079 | 0.7098 6516 | 55 |
| 56 | 0.7922 7354 | 0.7563 1122 | 0.7220 0907 | 0.7054 5606 | 56 |
| 57 | 0.7889 8610 | 0.7525 4847 | 0.7178 2178 | 0.7010 7434 | 57 |
| 58 | 0.7857 1230 | 0.7488 0445 | 0.7136 5877 | 0.6967 1985 | 58 |
| 59 | 0.7824 5208 | 0.7450 7906 | 0.7095 1990 | 0.6923 9239 | 59 |
| 60 | 0.7792 0539 | 0.7413 7220 | 0.7054 0504 | 0.6880 9182 | 60 |
| 61 | 0.7759 7217 | 0.7376 8378 | 0.7013 1404 | 0.6838 1796 | 61 |
| 62 | 0.7727 5237 | 0.7340 1371 | 0.6972 4677 | 0.6795 7064 | 62 |
| 63 | 0.7695 4593 | 0.7303 6190 | 0.6932 0308 | 0.6753 4970 | 63 |
| 64 | 0.7663 5279 | 0.7267 2826 | 0.6891 8285 | 0.6711 5499 | 64 |
| 65 | 0.7631 7291 | 0.7231 1269 | 0.6851 8593 | 0.6669 8632 | 65 |
| 66 | 0.7600 0621 | 0.7195 1512 | 0.6812 1219 | 0.6628 4355 | 66 |
| 67 | 0.7568 5266 | 0.7159 3544 | 0.6772 6150 | 0.6587 2651 | 67 |
| 68 | 0.7537 1219 | 0.7123 7357 | 0.6733 3372 | 0.6546 3504 | 68 |
| 69 | 0.7505 8476 | 0.7088 2943 | 0.6694 2872 | 0.6505 6898 | 69 |
| 70 | 0.7474 7030 | 0.7053 0291 | 0.6655 4637 | 0.6465 2818 | 70 |
| 71 | 0.7443 6876 | 0.7017 9394 | 0.6616 8653 | 0.6425 1248 | 71 |
| 72 | 0.7412 8009 | 0.6983 0243 | 0.6578 4908 | 0.6385 2172 | 72 |
| 73 | 0.7382 0424 | 0.6948 2829 | 0.6540 3388 | 0.6345 5574 | 73 |
| 74 | 0.7351 4115 | 0.6913 7143 | 0.6502 4081 | 0.6306 1440 | 74 |
| 75 | 0.7320 9078 | 0.6879 3177 | 0.6464 6973 | 0.6266 9754 | 75 |
| 76 | 0.7290 5306 | 0.6845 0923 | 0.6427 2053 | 0.6228 0501 | 76 |
| 77 | 0.7260 2794 | 0.6811 0371 | 0.6389 9307 | 0.6189 3666 | 77 |
| 78 | 0.7230 1537 | 0.6777 1513 | 0.6352 8723 | 0.6150 9233 | 78 |
| 79 | 0.7200 1531 | 0.6743 4342 | 0.6316 0288 | 0.6112 7188 | 79 |
| 80 | 0.7170 2770 | 0.6709 8847 | 0.6279 3990 | 0.6074 7516 | 80 |
| 81 | 0.7140 5248 | 0.6676 5022 | 0.6242 9816 | 0.6037 0203 | 81 |
| 82 | 0.7110 8960 | 0.6643 2858 | 0.6206 7754 | 0.5999 5232 | 82 |
| 83 | 0.7081 3902 | 0.6610 2346 | 0.6170 7792 | 0.5962 2591 | 83 |
| 84 | 0.7052 0069 | 0.6577 3479 | 0.6134 9917 | 0.5925 2264 | 84 |
| 85 | 0.7022 7454 | 0.6544 6248 | 0.6099 4118 | 0.5888 4238 | 85 |
| 86 | 0.6993 6054 | 0.6512 0644 | 0.6064 0382 | 0.5851 8497 | 86 |
| 87 | 0.6964 5863 | 0.6479 6661 | 0.6028 8698 | 0.5815 5028 | 87 |
| 88 | 0.6935 6876 | 0.6447 4290 | 0.5993 9054 | 0.5779 3817 | 88 |
| 89 | 0.6906 9088 | 0.6415 3522 | 0.5959 1437 | 0.5743 4849 | 89 |
| 90 | 0.6878 2495 | 0.6383 4350 | 0.5924 5836 | 0.5707 8111 | 90 |
| 91 | 0.6849 7090 | 0.6351 6766 | 0.5890 2240 | 0.5672 3589 | 91 |
| 92 | 0.6821 2870 | 0.6320 0763 | 0.5856 0636 | 0.5637 1268 | 92 |
| 93 | 0.6792 9829 | 0.6288 6331 | 0.5822 1014 | 0.5602 1136 | 93 |
| 94 | 0.6764 7962 | 0.6257 3464 | 0.5788 3361 | 0.5567 3179 | 94 |
| 95 | 0.6736 7265 | 0.6226 2153 | 0.5754 7666 | 0.5532 7383 | 95 |
| 96 | 0.6708 7733 | 0.6195 2391 | 0.5721 3918 | 0.5498 3734 | 96 |
| 97 | 0.6680 9361 | 0.6164 4170 | 0.5688 2106 | 0.5464 2220 | 97 |
| 98 | 0.6653 2143 | 0.6133 7483 | 0.5655 2218 | 0.5430 2828 | 98 |
| 99 | 0.6625 6076 | 0.6103 2321 | 0.5622 4243 | 0.5396 5543 | 99 |
| 100 | 0.6598 1155 | 0.6072 8678 | 0.5589 8171 | 0.5363 0353 | 100 |

## PRESENT VALUE OF 1

$$v^n = (1 + i)^{-n}$$

| $n$ | $\frac{3}{4}\%$ | $\frac{7}{8}\%$ | $1\%$ | $1\frac{1}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 0.9925 5583 | 0.9913 2590 | 0.9900 9901 | 0.9888 7515 | 1 |
| 2 | 0.9851 6708 | 0.9827 2704 | 0.9802 9605 | 0.9778 7407 | 2 |
| 3 | 0.9778 3333 | 0.9742 0276 | 0.9705 9015 | 0.9669 9537 | 3 |
| 4 | 0.9705 5417 | 0.9657 5243 | 0.9609 8034 | 0.9562 3770 | 4 |
| 5 | 0.9633 2920 | 0.9573 7539 | 0.9514 6569 | 0.9455 9970 | 5 |
| 6 | 0.9561 5802 | 0.9490 7102 | 0.9420 4524 | 0.9350 8005 | 6 |
| 7 | 0.9490 4022 | 0.9408 3868 | 0.9327 1805 | 0.9246 7743 | 7 |
| 8 | 0.9419 7540 | 0.9326 7775 | 0.9234 8322 | 0.9143 9054 | 8 |
| 9 | 0.9349 6318 | 0.9245 8761 | 0.9143 3982 | 0.9042 1808 | 9 |
| 10 | 0.9280 0315 | 0.9165 6765 | 0.9052 8695 | 0.8941 5880 | 10 |
| 11 | 0.9210 9494 | 0.9086 1724 | 0.8963 2372 | 0.8842 1142 | 11 |
| 12 | 0.9142 3815 | 0.9007 3581 | 0.8874 4923 | 0.8743 7470 | 12 |
| 13 | 0.9074 3241 | 0.8929 2273 | 0.8786 6260 | 0.8646 4742 | 13 |
| 14 | 0.9006 7733 | 0.8851 7743 | 0.8699 6297 | 0.8550 2835 | 14 |
| 15 | 0.8939 7254 | 0.8774 9931 | 0.8613 4947 | 0.8455 1629 | 15 |
| 16 | 0.8873 1766 | 0.8698 8779 | 0.8528 2126 | 0.8361 1005 | 16 |
| 17 | 0.8807 1231 | 0.8623 4230 | 0.8443 7749 | 0.8268 0846 | 17 |
| 18 | 0.8741 5614 | 0.8548 6225 | 0.8360 1731 | 0.8176 1034 | 18 |
| 19 | 0.8676 4878 | 0.8474 4709 | 0.8277 3992 | 0.8085 1455 | 19 |
| 20 | 0.8611 8985 | 0.8400 9624 | 0.8195 4447 | 0.7995 1995 | 20 |
| 21 | 0.8547 7901 | 0.8328 0917 | 0.8114 3017 | 0.7906 2542 | 21 |
| 22 | 0.8484 1589 | 0.8255 8530 | 0.8033 9621 | 0.7818 2983 | 22 |
| 23 | 0.8421 0014 | 0.8184 2409 | 0.7954 4179 | 0.7731 3210 | 23 |
| 24 | 0.8358 3140 | 0.8113 2499 | 0.7875 6613 | 0.7645 3112 | 24 |
| 25 | 0.8296 0933 | 0.8042 8748 | 0.7797 6844 | 0.7560 2583 | 25 |
| 26 | 0.8234 3358 | 0.7973 1101 | 0.7720 4796 | 0.7476 1516 | 26 |
| 27 | 0.8173 0380 | 0.7903 9505 | 0.7644 0392 | 0.7392 9806 | 27 |
| 28 | 0.8112 1966 | 0.7835 3908 | 0.7568 3557 | 0.7310 7348 | 28 |
| 29 | 0.8051 8080 | 0.7767 4258 | 0.7493 4215 | 0.7229 4040 | 29 |
| 30 | 0.7991 8690 | 0.7700 0504 | 0.7419 2292 | 0.7148 9780 | 30 |
| 31 | 0.7932 3762 | 0.7633 2594 | 0.7345 7715 | 0.7069 4467 | 31 |
| 32 | 0.7873 3262 | 0.7567 0477 | 0.7273 0411 | 0.6990 8002 | 32 |
| 33 | 0.7814 7158 | 0.7501 4104 | 0.7201 0307 | 0.6913 0287 | 33 |
| 34 | 0.7756 5418 | 0.7436 3424 | 0.7129 7334 | 0.6836 1223 | 34 |
| 35 | 0.7698 8008 | 0.7371 8388 | 0.7059 1420 | 0.6760 0715 | 35 |
| 36 | 0.7641 4896 | 0.7307 8947 | 0.6989 2495 | 0.6684 8667 | 36 |
| 37 | 0.7584 6051 | 0.7244 5053 | 0.6920 0490 | 0.6610 4986 | 37 |
| 38 | 0.7528 1440 | 0.7181 6657 | 0.6851 5337 | 0.6536 9578 | 38 |
| 39 | 0.7472 1032 | 0.7119 3712 | 0.6783 6967 | 0.6464 2352 | 39 |
| 40 | 0.7416 4796 | 0.7057 6171 | 0.6716 5314 | 0.6392 3216 | 40 |
| 41 | 0.7361 2701 | 0.6996 3986 | 0.6650 0311 | 0.6321 2080 | 41 |
| 42 | 0.7306 4716 | 0.6935 7111 | 0.6584 1892 | 0.6250 8855 | 42 |
| 43 | 0.7252 0809 | 0.6875 5500 | 0.6518 9992 | 0.6181 3454 | 43 |
| 44 | 0.7198 0952 | 0.6815 9108 | 0.6454 4546 | 0.6112 5789 | 44 |
| 45 | 0.7144 5114 | 0.6756 7889 | 0.6390 5492 | 0.6044 5774 | 45 |
| 46 | 0.7091 3264 | 0.6698 1798 | 0.6327 2764 | 0.5977 3324 | 46 |
| 47 | 0.7038 5374 | 0.6640 0792 | 0.6264 6301 | 0.5910 8355 | 47 |
| 48 | 0.6986 1414 | 0.6582 4824 | 0.6202 6041 | 0.5845 0784 | 48 |
| 49 | 0.6934 1353 | 0.6525 3853 | 0.6141 1921 | 0.5780 0528 | 49 |
| 50 | 0.6882 5165 | 0 6468 7835 | 0.6080 3882 | 0.5715 7506 | 50 |

## PRESENT VALUE OF 1

$$v^n = (1 + i)^{-n}$$

| $n$ | $\frac{3}{4}\%$ | $\frac{7}{8}\%$ | $1\%$ | $1\frac{1}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 51 | 0.6831 2819 | 0.6412 6726 | 0.6020 1864 | 0.5652 1637 | 51 |
| 52 | 0.6780 4286 | 0.6357 0484 | 0.5960 5806 | 0.5589 2843 | 52 |
| 53 | 0.6729 9540 | 0.6301 9067 | 0.5901 5649 | 0.5527 1044 | 53 |
| 54 | 0.6679 8551 | 0.6247 2433 | 0.5843 1336 | 0.5465 6162 | 54 |
| 55 | 0.6630 1291 | 0.6193 0541 | 0.5785 2808 | 0.5404 8120 | 55 |
| 56 | 0.6580 7733 | 0.6139 3349 | 0.5728 0008 | 0.5344 6843 | 56 |
| 57 | 0.6531 7849 | 0.6086 0817 | 0.5671 2879 | 0.5285 2256 | 57 |
| 58 | 0.6483 1612 | 0.6033 2904 | 0.5615 1365 | 0.5226 4282 | 58 |
| 59 | 0.6434 8995 | 0.5980 9571 | 0.5559 5411 | 0.5168 2850 | 59 |
| 60 | 0.6386 9970 | 0.5929 0776 | 0.5504 4962 | 0.5110 7887 | 60 |
| 61 | 0.6339 4511 | 0.5877 6482 | 0.5449 9962 | 0.5053 9319 | 61 |
| 62 | 0.6292 2592 | 0.5826 6649 | 0.5396 0358 | 0.4997 7077 | 62 |
| 63 | 0.6245 4185 | 0.5776 1238 | 0.5342 6097 | 0.4942 1090 | 63 |
| 64 | 0.6198 9266 | 0.5726 0211 | 0.5289 7126 | 0.4887 1288 | 64 |
| 65 | 0.6152 7807 | 0.5676 3530 | 0.5237 3392 | 0.4832 7602 | 65 |
| 66 | 0.6106 9784 | 0.5627 1158 | 0.5185 4844 | 0.4778 9965 | 66 |
| 67 | 0.6061 5170 | 0.5578 3056 | 0.5134 1429 | 0.4725 8309 | 67 |
| 68 | 0.6016 3940 | 0.5529 9188 | 0.5083 3099 | 0.4673 2568 | 68 |
| 69 | 0.5971 6070 | 0.5481 9517 | 0.5032 9801 | 0.4621 2675 | 69 |
| 70 | 0.5927 1533 | 0.5434 4007 | 0.4983 1486 | 0.4569 8566 | 70 |
| 71 | 0.5883 0306 | 0.5387 2622 | 0.4933 8105 | 0.4519 0177 | 71 |
| 72 | 0.5839 2363 | 0.5340 5325 | 0.4884 9609 | 0.4468 7443 | 72 |
| 73 | 0.5795 7681 | 0.5294 2082 | 0.4836 5949 | 0.4419 0302 | 73 |
| 74 | 0.5752 6234 | 0.5248 2857 | 0.4788 7078 | 0.4369 8692 | 74 |
| 75 | 0.5709 7999 | 0.5202 7615 | 0.4741 2949 | 0.4321 2551 | 75 |
| 76 | 0.5667 2952 | 0.5157 6322 | 0.4694 3514 | 0.4273 1818 | 76 |
| 77 | 0.5625 1069 | 0.5112 8944 | 0.4647 8726 | 0.4225 6433 | 77 |
| 78 | 0.5583 2326 | 0.5068 5447 | 0.4601 8541 | 0.4178 6337 | 78 |
| 79 | 0.5541 6701 | 0.5024 5796 | 0.4556 2912 | 0.4132 1470 | 79 |
| 80 | 0.5500 4170 | 0.4980 9959 | 0.4511 1794 | 0.4086 1775 | 80 |
| 81 | 0.5459 4710 | 0.4937 7902 | 0.4466 5142 | 0.4040 7194 | 81 |
| 82 | 0.5418 8297 | 0.4894 9593 | 0.4422 2913 | 0.3995 7670 | 82 |
| 83 | 0.5378 4911 | 0.4852 4999 | 0.4378 5063 | 0.3951 3148 | 83 |
| 84 | 0.5338 4527 | 0.4810 4089 | 0.4335 1547 | 0.3907 3570 | 84 |
| 85 | 0.5298 7123 | 0.4768 6829 | 0.4292 2324 | 0.3863 8882 | 85 |
| 86 | 0.5259 2678 | 0.4727 3188 | 0.4249 7350 | 0.3820 9031 | 86 |
| 87 | 0.5220 1169 | 0.4686 3136 | 0.4207 6585 | 0.3778 3961 | 87 |
| 88 | 0.5181 2575 | 0.4645 6640 | 0.4165 9985 | 0.3736 3621 | 88 |
| 89 | 0.5142 6873 | 0.4605 3671 | 0.4124 7510 | 0.3694 7956 | 89 |
| 90 | 0.5104 4043 | 0.4565 4197 | 0.4083 9119 | 0.3653 6916 | 90 |
| 91 | 0.5066 4063 | 0.4525 8187 | 0.4043 4771 | 0.3613 0448 | 91 |
| 92 | 0.5028 6911 | 0.4486 5613 | 0.4003 4427 | 0.3572 8503 | 92 |
| 93 | 0.4991 2567 | 0.4447 6444 | 0.3963 8046 | 0.3533 1029 | 93 |
| 94 | 0.4954 1009 | 0.4409 0651 | 0.3924 5590 | 0.3493 7976 | 94 |
| 95 | 0.4917 2217 | 0.4370 8204 | 0.3885 7020 | 0.3454 9297 | 95 |
| 96 | 0.4880 6171 | 0.4332 9075 | 0.3847 2297 | 0.3416 4941 | 96 |
| 97 | 0.4844 2850 | 0.4295 3234 | 0.3809 1383 | 0.3378 4861 | 97 |
| 98 | 0.4808 2233 | 0.4258 0654 | 0.3771 4241 | 0.3340 9010 | 98 |
| 99 | 0.4772 4301 | 0.4221 1305 | 0.3734 0832 | 0.3303 7340 | 99 |
| 100 | 0.4736 9033 | 0.4184 5159 | 0.3697 1121 | 0.3266 9805 | 100 |

## PRESENT VALUE OF 1

$$v^n = (1 + i)^{-n}$$

| $n$ | $1\frac{1}{4}\%$ | $1\frac{3}{8}\%$ | $1\frac{1}{2}\%$ | $1\frac{5}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 0.9876 5432 | 0.9864 3650 | 0.9852 2167 | 0.9840 0984 | 1 |
| 2 | 0.9754 6106 | 0.9730 5696 | 0.9706 6175 | 0.9682 7537 | 2 |
| 3 | 0.9634 1833 | 0.9598 5890 | 0.9563 1699 | 0.9527 9249 | 3 |
| 4 | 0.9515 2428 | 0.9468 3986 | 0.9421 8423 | 0.9375 5718 | 4 |
| 5 | 0.9397 7706 | 0.9339 9739 | 0.9282 6033 | 0.9225 6549 | 5 |
| 6 | 0.9281 7488 | 0.9213 2912 | 0.9145 4219 | 0.9078 1352 | 6 |
| 7 | 0.9167 1593 | 0.9088 3267 | 0.9010 2679 | 0.8932 9744 | 7 |
| 8 | 0.9053 9845 | 0.8965 0571 | 0.8877 1112 | 0.8790 1347 | 8 |
| 9 | 0.8942 2069 | 0.8843 4596 | 0.8745 9224 | 0 8649 5791 | 9 |
| 10 | 0.8831 8093 | 0.8723 5113 | 0.8616 6723 | 0.8511 2709 | 10 |
| 11 | 0.8722 7746 | 0.8605 1899 | 0.8489 3323 | 0.8375 1743 | 11 |
| 12 | 0.8615 0860 | 0.8488 4734 | 0.8363 8742 | 0.8241 2539 | 12 |
| 13 | 0.8508 7269 | 0.8373 3400 | 0.8240 2702 | 0.8109 4750 | 13 |
| 14 | 0.8403 6809 | 0.8259 7682 | 0.8118 4928 | 0.7979 8032 | 14 |
| 15 | 0.8299 9318 | 0.8147 7368 | 0.7998 5150 | 0.7852 2048 | 15 |
| 16 | 0.8197 4635 | 0.8037 2250 | 0.7880 3104 | 0.7726 6468 | 16 |
| 17 | 0.8096 2602 | 0.7928 2120 | 0.7763 8526 | 0.7603 0965 | 17 |
| 18 | 0.7996 3064 | 0.7820 6777 | 0.7649 1159 | 0.7481 5218 | 18 |
| 19 | 0.7897 5866 | 0.7714 6020 | 0.7536 0747 | 0.7361 8911 | 19 |
| 20 | 0.7800 0855 | 0.7609 9649 | 0.7424 7042 | 0.7244 1732 | 20 |
| 21 | 0.7703 7881 | 0.7506 7472 | 0.7314 9795 | 0.7128 3378 | 21 |
| 22 | 0.7608 6796 | 0.7404 9294 | 0.7206 8763 | 0.7014 3545 | 22 |
| 23 | 0.7514 7453 | 0.7304 4926 | 0.7100 3708 | 0.6902 1938 | 23 |
| 24 | 0.7421 9707 | 0.7205 4181 | 0.6995 4392 | 0.6791 8267 | 24 |
| 25 | 0.7330 3414 | 0.7107 6874 | 0.6892 0583 | 0.6683 2243 | 25 |
| 26 | 0.7239 8434 | 0.7011 2823 | 0.6790 2052 | 0.6576 3584 | 26 |
| 27 | 0.7150 4626 | 0.6916 1847 | 0.6689 8574 | 0.6471 2014 | 27 |
| 28 | 0.7062 1853 | 0.6822 3771 | 0.6590 9925 | 0.6367 7259 | 28 |
| 29 | 0.6974 9978 | 0.6729 8417 | 0.6493 5887 | 0.6265 9049 | 29 |
| 30 | 0.6888 8867 | 0.6638 5615 | 0.6397 6243 | 0.6165 7121 | 30 |
| 31 | 0.6803 8387 | 0.6548 5194 | 0.6303 0781 | 0.6067 1214 | 31 |
| 32 | 0.6719 8407 | 0.6459 6985 | 0.6209 9292 | 0.5970 1071 | 32 |
| 33 | 0.6636 8797 | 0.6372 0824 | 0.6118 1568 | 0.5874 6442 | 33 |
| 34 | 0.6554 9429 | 0.6285 6546 | 0.6027 7407 | 0.5780 7077 | 34 |
| 35 | 0.6474 0177 | 0.6200 3991 | 0.5938 6608 | 0.5688 2732 | 35 |
| 36 | 0.6394 0916 | 0.6116 3000 | 0.5850 8974 | 0.5597 3168 | 36 |
| 37 | 0.6315 1522 | 0.6033 3416 | 0.5764 4309 | 0.5507 8148 | 37 |
| 38 | 0.6237 1873 | 0.5951 5083 | 0.5679 2423 | 0.5419 7440 | 38 |
| 39 | 0.6160 1850 | 0.5870 7850 | 0.5595 3126 | 0.5333 0814 | 39 |
| 40 | 0.6084 1334 | 0.5791 1566 | 0.5512 6232 | 0.5247 8046 | 40 |
| 41 | 0.6009 0206 | 0.5712 6083 | 0.5431 1559 | 0.5163 8914 | 41 |
| 42 | 0.5934 8352 | 0.5635 1253 | 0.5350 8925 | 0.5081 3199 | 42 |
| 43 | 0.5861 5656 | 0.5558 6933 | 0.5271 8153 | 0.5000 0688 | 43 |
| 44 | 0.5789 2006 | 0.5483 2979 | 0.5193 9067 | 0.4920 1169 | 44 |
| 45 | 0.5717 7290 | 0.5408 9252 | 0.5117 1494 | 0.4841 4434 | 45 |
| 46 | 0.5647 1397 | 0.5335 5612 | 0.5041 5265 | 0.4764 0280 | 46 |
| 47 | 0.5577 4219 | 0.5263 1923 | 0.4967 0212 | 0.4687 8504 | 47 |
| 48 | 0.5508 5649 | 0.5191 8050 | 0.4893 6170 | 0.4612 8909 | 48 |
| 49 | 0.5440 5579 | 0.5121 3860 | 0.4821 2975 | 0.4539 1301 | 49 |
| 50 | 0.5373 3905 | 0.5051 9220 | 0.4750 0468 | 0.4466 5487 | 50 |

## PRESENT VALUE OF 1

$$v^n = (1 + i)^{-n}$$

| $n$ | $1\frac{1}{4}\%$ | $1\frac{3}{8}\%$ | $1\frac{1}{2}\%$ | $1\frac{5}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 51 | 0.5307 0524 | 0.4983 4003 | 0.4679 8491 | 0.4395 1278 | 51 |
| 52 | 0.5241 5332 | 0.4915 8079 | 0.4610 6887 | 0.4324 8490 | 52 |
| 53 | 0.5176 8229 | 0.4849 1323 | 0.4542 5505 | 0.4255 6940 | 53 |
| 54 | 0.5112 9115 | 0.4783 3611 | 0.4475 4192 | 0.4187 6448 | 54 |
| 55 | 0.5049 7892 | 0.4718 4820 | 0.4409 2800 | 0.4120 6837 | 55 |
| 56 | 0.4987 4461 | 0.4654 4829 | 0.4344 1182 | 0.4054 7933 | 56 |
| 57 | 0.4925 8727 | 0.4591 3518 | 0.4279 9194 | 0.3989 9565 | 57 |
| 58 | 0.4865 0594 | 0.4529 0770 | 0.4216 6694 | 0.3926 1564 | 58 |
| 59 | 0.4804 9970 | 0.4467 6468 | 0.4154 3541 | 0.3863 3766 | 59 |
| 60 | 0.4745 6760 | 0.4407 0499 | 0.4092 9597 | 0.3801 6006 | 60 |
| 61 | 0.4687 0874 | 0.4347 2749 | 0.4032 4726 | 0.3740 8124 | 61 |
| 62 | 0.4629 2222 | 0.4288 3106 | 0.3972 8794 | 0.3680 9962 | 62 |
| 63 | 0.4572 0713 | 0.4230 1461 | 0.3914 1669 | 0.3622 1365 | 63 |
| 64 | 0.4515 6259 | 0.4172 7705 | 0.3856 3221 | 0.3564 2179 | 64 |
| 65 | 0.4459 8775 | 0.4116 1731 | 0.3799 3321 | 0.3507 2255 | 65 |
| 66 | 0.4404 8173 | 0.4060 3434 | 0.3743 1843 | 0.3451 1444 | 66 |
| 67 | 0.4350 4368 | 0.4005 2709 | 0.3687 8663 | 0.3395 9601 | 67 |
| 68 | 0.4296 7277 | 0.3950 9454 | 0.3633 3658 | 0.3341 6581 | 68 |
| 69 | 0.4243 6817 | 0.3897 3568 | 0.3579 6708 | 0.3288 2245 | 69 |
| 70 | 0.4191 2905 | 0.3844 4949 | 0.3526 7692 | 0.3235 6452 | 70 |
| 71 | 0.4139 5462 | 0.3792 3501 | 0.3474 6495 | 0.3183 9067 | 71 |
| 72 | 0.4088 4407 | 0.3740 9126 | 0.3423 3000 | 0.3132 9956 | 72 |
| 73 | 0.4037 9661 | 0.3690 1727 | 0.3372 7093 | 0.3082 8985 | 73 |
| 74 | 0.3988 1147 | 0.3640 1210 | 0.3322 8663 | 0.3033 6024 | 74 |
| 75 | 0.3938 8787 | 0.3590 7483 | 0.3273 7599 | 0.2985 0946 | 75 |
| 76 | 0.3890 2506 | 0.3542 0451 | 0.3225 3793 | 0.2937 3625 | 76 |
| 77 | 0.3842 2228 | 0.3494 0026 | 0.3177 7136 | 0.2890 3936 | 77 |
| 78 | 0.3794 7879 | 0.3446 6117 | 0.3130 7523 | 0.2844 1757 | 78 |
| 79 | 0.3747 9387 | 0.3399 8636 | 0.3084 4850 | 0.2798 6969 | 79 |
| 80 | 0.3701 6679 | 0.3353 7495 | 0.3038 9015 | 0.2753 9453 | 80 |
| 81 | 0.3655 9683 | 0.3308 2609 | 0.2993 9916 | 0.2709 9093 | 81 |
| 82 | 0.3610 8329 | 0.3263 3893 | 0.2949 7454 | 0.2666 5774 | 82 |
| 83 | 0.3566 2547 | 0.3219 1263 | 0.2906 1531 | 0.2623 9384 | 83 |
| 84 | 0.3522 2268 | 0.3175 4637 | 0.2863 2050 | 0.2581 9812 | 84 |
| 85 | 0.3478 7426 | 0.3132 3933 | 0.2820 8917 | 0.2540 6949 | 85 |
| 86 | 0.3435 7951 | 0.3089 9071 | 0.2779 2036 | 0.2500 0688 | 86 |
| 87 | 0.3393 3779 | 0.3047 9971 | 0.2738 1316 | 0.2460 0923 | 87 |
| 88 | 0.3351 4843 | 0.3006 6556 | 0.2697 6666 | 0.2420 7550 | 88 |
| 89 | 0.3310 1080 | 0.2965 8748 | 0.2657 7997 | 0.2382 0468 | 89 |
| 90 | 0.3269 2425 | 0.2925 6472 | 0.2618 5218 | 0.2343 9575 | 90 |
| 91 | 0.3228 8814 | 0.2885 9652 | 0.2579 8245 | 0.2306 4772 | 91 |
| 92 | 0.3189 0187 | 0.2846 8214 | 0.2541 6990 | 0.2269 5963 | 92 |
| 93 | 0.3149 6481 | 0.2808 2085 | 0.2504 1369 | 0.2233 3051 | 93 |
| 94 | 0.3110 7636 | 0.2770 1194 | 0.2467 1300 | 0.2197 5942 | 94 |
| 95 | 0.3072 3591 | 0.2732 5468 | 0.2430 6699 | 0.2162 4543 | 95 |
| 96 | 0.3034 4287 | 0.2695 4839 | 0.2394 7487 | 0.2127 8763 | 96 |
| 97 | 0.2996 9666 | 0.2658 9237 | 0.2359 3583 | 0.2093 8512 | 97 |
| 98 | 0.2959 9670 | 0.2622 8594 | 0.2324 4909 | 0.2060 3702 | 98 |
| 99 | 0.2923 4242 | 0.2587 2843 | 0.2290 1389 | 0.2027 4245 | 99 |
| 100 | 0.2887 3326 | 0.2552 1916 | 0.2256 2944 | 0.1995 0057 | 100 |

## PRESENT VALUE OF 1

$$v^n = (1 + i)^{-n}$$

| $n$ | $1\frac{3}{4}\%$ | $2\%$ | $2\frac{1}{4}\%$ | $2\frac{1}{2}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 0.9828 0098 | 0.9803 9216 | 0.9779 9511 | 0.9756 0976 | 1 |
| 2 | 0.9658 9777 | 0.9611 6878 | 0.9564 7444 | 0.9518 1440 | 2 |
| 3 | 0.9492 8528 | 0.9423 2233 | 0.9354 2732 | 0.9285 9941 | 3 |
| 4 | 0.9329 5851 | 0.9238 4543 | 0.9148 4335 | 0.9059 5064 | 4 |
| 5 | 0.9169 1254 | 0.9057 3081 | 0.8947 1232 | 0.8838 5429 | 5 |
| 6 | 0.9011 4254 | 0.8879 7138 | 0.8750 2427 | 0.8622 9687 | 6 |
| 7 | 0.8856 4378 | 0.8705 6018 | 0.8557 6946 | 0.8412 6524 | 7 |
| 8 | 0.8704 1157 | 0.8534 9037 | 0.8369 3835 | 0.8207 4657 | 8 |
| 9 | 0.8554 4135 | 0.8367 5527 | 0.8185 2161 | 0.8007 2836 | 9 |
| 10 | 0.8407 2860 | 0.8203 4830 | 0.8005 1013 | 0.7811 9840 | 10 |
| 11 | 0.8262 6889 | 0.8042 6304 | 0.7828 9499 | 0.7621 4478 | 11 |
| 12 | 0.8120 5788 | 0.7884 9318 | 0.7656 6748 | 0.7435 5589 | 12 |
| 13 | 0.7980 9128 | 0.7730 3253 | 0.7488 1905 | 0.7254 2038 | 13 |
| 14 | 0.7843 6490 | 0.7578 7502 | 0.7323 4137 | 0.7077 2720 | 14 |
| 15 | 0.7708 7459 | 0.7430 1473 | 0.7162 2628 | 0.6904 6556 | 15 |
| 16 | 0.7576 1631 | 0.7284 4581 | 0.7004 6580 | 0.6736 2493 | 16 |
| 17 | 0.7445 8605 | 0.7141 6256 | 0.6850 5212 | 0.6571 9506 | 17 |
| 18 | 0.7317 7990 | 0.7001 5937 | 0.6699 7763 | 0.6411 6591 | 18 |
| 19 | 0.7191 9401 | 0.6864 3076 | 0.6552 3484 | 0.6255 2772 | 19 |
| 20 | 0.7068 2458 | 0.6729 7133 | 0.6408 1647 | 0.6102 7094 | 20 |
| 21 | 0.6946 6789 | 0.6597 7582 | 0.6267 1538 | 0.5953 8629 | 21 |
| 22 | 0.6827 2028 | 0.6468 3904 | 0.6129 2457 | 0.5808 6467 | 22 |
| 23 | 0.6709 7817 | 0.6341 5592 | 0.5994 3724 | 0.5666 9724 | 23 |
| 24 | 0.6594 3800 | 0.6217 2149 | 0.5862 4668 | 0.5528 7535 | 24 |
| 25 | 0.6480 9632 | 0.6095 3087 | 0.5733 4639 | 0.5393 9059 | 25 |
| 26 | 0.6369 4970 | 0.5975 7928 | 0.5607 2997 | 0.5262 3472 | 26 |
| 27 | 0.6259 9479 | 0.5858 6204 | 0.5483 9117 | 0.5133 9973 | 27 |
| 28 | 0.6152 2829 | 0.5743 7455 | 0.5363 2388 | 0.5008 7778 | 28 |
| 29 | 0.6046 4697 | 0.5631 1231 | 0.5245 2213 | 0.4886 6125 | 29 |
| 30 | 0.5942 4764 | 0.5520 7089 | 0.5129 8008 | 0.4767 4269 | 30 |
| 31 | 0.5840 2716 | 0.5412 4597 | 0.5016 9201 | 0.4651 1481 | 31 |
| 32 | 0.5739 8247 | 0.5306 3330 | 0.4906 5233 | 0.4537 7055 | 32 |
| 33 | 0.5641 1053 | 0.5202 2873 | 0.4798 5558 | 0.4427 0298 | 33 |
| 34 | 0.5544 0839 | 0.5100 2817 | 0.4692 9641 | 0.4319 0534 | 34 |
| 35 | 0.5448 7311 | 0.5000 2761 | 0.4589 6960 | 0.4213 7107 | 35 |
| 36 | 0.5355 0183 | 0.4902 2315 | 0.4488 7002 | 0.4110 9372 | 36 |
| 37 | 0.5262 9172 | 0.4806 1093 | 0.4389 9268 | 0.4010 6705 | 37 |
| 38 | 0.5172 4002 | 0.4711 8719 | 0.4293 3270 | 0.3912 8492 | 38 |
| 39 | 0.5083 4400 | 0.4619 4822 | 0.4198 8528 | 0.3817 4139 | 39 |
| 40 | 0.4996 0098 | 0.4528 9042 | 0.4106 4575 | 0.3724 3062 | 40 |
| 41 | 0.4910 0834 | 0.4440 1021 | 0.4016 0954 | 0.3633 4695 | 41 |
| 42 | 0.4825 6348 | 0.4353 0413 | 0.3927 7216 | 0.3544 8483 | 42 |
| 43 | 0.4742 6386 | 0.4267 6875 | 0.3841 2925 | 0.3458 3886 | 43 |
| 44 | 0.4661 0699 | 0.4184 0074 | 0.3756 7653 | 0.3374 0376 | 44 |
| 45 | 0.4580 9040 | 0.4101 9680 | 0.3674 0981 | 0.3291 7440 | 45 |
| 46 | 0.4502 1170 | 0.4021 5373 | 0.3593 2500 | 0.3211 4576 | 46 |
| 47 | 0.4424 6850 | 0.3942 6836 | 0.3514 1809 | 0.3133 1294 | 47 |
| 48 | 0.4348 5848 | 0.3865 3761 | 0.3436 8518 | 0.3056 7116 | 48 |
| 49 | 0.4273 7934 | 0.3789 5844 | 0.3361 2242 | 0.2982 1576 | 49 |
| 50 | 0.4200 2883 | 0.3715 2788 | 0.3287 2608 | 0.2909 4221 | 50 |

## PRESENT VALUE OF 1

$$v^n = (1 + i)^{-n}$$

| $n$ | $2\frac{3}{4}\%$ | 3% | $3\frac{1}{4}\%$ | $3\frac{1}{2}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 0.9732 3601 | 0.9708 7379 | 0.9685 2300 | 0.9661 8357 | 1 |
| 2 | 0.9471 8833 | 0.9425 9591 | 0.9380 3681 | 0.9335 1070 | 2 |
| 3 | 0.9218 3779 | 0.9151 4166 | 0.9085 1022 | 0.9019 4271 | 3 |
| 4 | 0.8971 6573 | 0.8884 8705 | 0.8799 1305 | 0.8714 4223 | 4 |
| 5 | 0.8731 5400 | 0.8626 0878 | 0.8522 1603 | 0.8419 7317 | 5 |
| 6 | 0.8497 8491 | 0.8374 8426 | 0.8253 9083 | 0.8135 0064 | 6 |
| 7 | 0.8270 4128 | 0.8130 9151 | 0.7994 1000 | 0.7859 9096 | 7 |
| 8 | 0.8049 0635 | 0.7894 0923 | 0.7742 4698 | 0.7594 1156 | 8 |
| 9 | 0.7833 6385 | 0.7664 1673 | 0.7498 7601 | 0.7337 3097 | 9 |
| 10 | 0.7623 9791 | 0.7440 9391 | 0.7262 7216 | 0.7089 1881 | 10 |
| 11 | 0.7419 9310 | 0.7224 2128 | 0.7034 1129 | 0.6849 4571 | 11 |
| 12 | 0.7221 3440 | 0.7013 7988 | 0.6812 7002 | 0.6617 8330 | 12 |
| 13 | 0.7028 0720 | 0.6809 5134 | 0.6598 2568 | 0.6394 0415 | 13 |
| 14 | 0.6839 9728 | 0.6611 1781 | 0.6390 5635 | 0.6177 8179 | 14 |
| 15 | 0.6656 9078 | 0.6418 6195 | 0.6189 4078 | 0.5968 9062 | 15 |
| 16 | 0.6478 7424 | 0.6231 6694 | 0.5994 5838 | 0.5767 0591 | 16 |
| 17 | 0.6305 3454 | 0.6050 1645 | 0.5805 8923 | 0.5572 0378 | 17 |
| 18 | 0.6136 5892 | 0.5873 9461 | 0.5623 1402 | 0.5383 6114 | 18 |
| 19 | 0.5972 3496 | 0.5702 8603 | 0.5446 1407 | 0.5201 5569 | 19 |
| 20 | 0.5812 5057 | 0.5536 7575 | 0.5274 7125 | 0.5025 6588 | 20 |
| 21 | 0.5656 9398 | 0.5375 4928 | 0.5108 6804 | 0.4855 7090 | 21 |
| 22 | 0.5505 5375 | 0.5218 9250 | 0.4947 8745 | 0.4691 5063 | 22 |
| 23 | 0.5358 1874 | 0.5066 9175 | 0.4792 1302 | 0.4532 8563 | 23 |
| 24 | 0.5214 7809 | 0.4919 3374 | 0.4641 2884 | 0.4379 5713 | 24 |
| 25 | 0.5075 2126 | 0.4776 0557 | 0.4495 1945 | 0.4231 4699 | 25 |
| 26 | 0.4939 3796 | 0.4636 9473 | 0.4353 6993 | 0.4088 3767 | 26 |
| 27 | 0.4807 1821 | 0.4501 8906 | 0.4216 6579 | 0.3950 1224 | 27 |
| 28 | 0.4678 5227 | 0.4370 7675 | 0.4083 9302 | 0.3816 5434 | 28 |
| 29 | 0.4553 3068 | 0.4243 4636 | 0.3955 3803 | 0.3687 4815 | 29 |
| 30 | 0.4431 4421 | 0.4119 8676 | 0.3830 8768 | 0.3562 7841 | 30 |
| 31 | 0.4312 8391 | 0.3999 8715 | 0.3710 2923 | 0.3442 3035 | 31 |
| 32 | 0.4197 4103 | 0.3883 3703 | 0.3593 5035 | 0.3325 8971 | 32 |
| 33 | 0.4085 0708 | 0.3770 2625 | 0.3480 3908 | 0.3213 4271 | 33 |
| 34 | 0.3975 7380 | 0.3660 4490 | 0.3370 8385 | 0.3104 7605 | 34 |
| 35 | 0.3869 3314 | 0.3553 8340 | 0.3264 7346 | 0.2999 7686 | 35 |
| 36 | 0.3765 7727 | 0.3450 3243 | 0.3161 9706 | 0.2898 3272 | 36 |
| 37 | 0.3664 9856 | 0.3349 8294 | 0.3062 4413 | 0.2800 3161 | 37 |
| 38 | 0.3566 8959 | 0.3252 2615 | 0.2966 0448 | 0.2705 6194 | 38 |
| 39 | 0.3471 4316 | 0.3157 5355 | 0.2872 6826 | 0.2614 1250 | 39 |
| 40 | 0.3378 5222 | 0.3065 5684 | 0.2782 2592 | 0.2525 7247 | 40 |
| 41 | 0.3288 0995 | 0.2976 2800 | 0.2694 6820 | 0.2440 3137 | 41 |
| 42 | 0.3200 0968 | 0.2889 5922 | 0.2609 8615 | 0.2357 7910 | 42 |
| 43 | 0.3114 4495 | 0.2805 4294 | 0.2527 7109 | 0.2278 0590 | 43 |
| 44 | 0.3031 0944 | 0.2723 7178 | 0.2448 1462 | 0.2201 0231 | 44 |
| 45 | 0.2949 9702 | 0.2644 3862 | 0.2371 0859 | 0.2126 5924 | 45 |
| 46 | 0.2871 0172 | 0.2567 3653 | 0.2296 4512 | 0.2054 6787 | 46 |
| 47 | 0.2794 1773 | 0.2492 5876 | 0.2224 1658 | 0.1985 1968 | 47 |
| 48 | 0.2719 3940 | 0.2419 9880 | 0.2154 1558 | 0.1918 0645 | 48 |
| 49 | 0.2646 6122 | 0.2349 5029 | 0.2086 3494 | 0.1853 2024 | 49 |
| 50 | 0.2575 7783 | 0.2281 0708 | 0.2020 6774 | 0.1790 5337 | 50 |

# PRESENT VALUE OF 1

$$v^n = (1 + i)^{-n}$$

| $n$ | 4% | 4½% | 5% | 5½% | $n$ |
|---|---|---|---|---|---|
| 1 | 0.9615 3846 | 0.9569 3780 | 0.9523 8095 | 0.9478 6730 | 1 |
| 2 | 0.9245 5621 | 0.9157 2995 | 0.9070 2948 | 0.8984 5242 | 2 |
| 3 | 0.8889 9636 | 0.8762 9660 | 0.8638 3760 | 0.8516 1366 | 3 |
| 4 | 0.8548 0419 | 0.8385 6134 | 0.8227 0247 | 0.8072 1674 | 4 |
| 5 | 0.8219 2711 | 0.8024 5105 | 0.7835 2617 | 0.7651 3435 | 5 |
| 6 | 0.7903 1453 | 0.7678 9574 | 0.7462 1540 | 0.7252 4583 | 6 |
| 7 | 0.7599 1781 | 0.7348 2846 | 0.7106 8133 | 0.6874 3681 | 7 |
| 8 | 0.7306 9021 | 0.7031 8513 | 0.6768 3936 | 0.6515 9887 | 8 |
| 9 | 0.7025 8674 | 0.6729 0443 | 0.6446 0892 | 0.6176 2926 | 9 |
| 10 | 0.6755 6417 | 0.6439 2768 | 0.6139 1325 | 0.5854 3058 | 10 |
| 11 | 0.6495 8093 | 0.6161 9874 | 0.5846 7929 | 0.5549 1050 | 11 |
| 12 | 0.6245 9705 | 0.5896 6386 | 0.5568 3742 | 0.5259 8152 | 12 |
| 13 | 0.6005 7409 | 0.5642 7164 | 0.5303 2135 | 0.4985 6068 | 13 |
| 14 | 0.5774 7508 | 0.5399 7286 | 0.5050 6795 | 0.4725 6937 | 14 |
| 15 | 0.5552 6450 | 0.5167 2044 | 0.4810 1710 | 0.4479 3305 | 15 |
| 16 | 0.5339 0818 | 0.4944 6932 | 0.4581 1152 | 0.4245 8109 | 16 |
| 17 | 0.5133 7325 | 0.4731 7639 | 0.4362 9669 | 0.4024 4653 | 17 |
| 18 | 0.4936 2812 | 0.4528 0037 | 0.4155 2065 | 0.3814 6590 | 18 |
| 19 | 0.4746 4242 | 0.4333 0179 | 0.3957 3396 | 0.3615 7906 | 19 |
| 20 | 0.4563 8695 | 0.4146 4286 | 0.3768 8948 | 0.3427 2896 | 20 |
| 21 | 0.4388 3360 | 0.3967 8743 | 0.3589 4236 | 0.3248 6158 | 21 |
| 22 | 0.4219 5539 | 0.3797 0089 | 0.3418 4987 | 0.3079 2567 | 22 |
| 23 | 0.4057 2633 | 0.3633 5013 | 0.3255 7131 | 0.2918 7267 | 23 |
| 24 | 0.3901 2147 | 0.3477 0347 | 0.3100 6791 | 0.2766 5656 | 24 |
| 25 | 0.3751 1680 | 0.3327 3060 | 0.2953 0277 | 0.2622 3370 | 25 |
| 26 | 0.3606 8923 | 0.3184 0248 | 0.2812 4073 | 0.2485 6275 | 26 |
| 27 | 0.3468 1657 | 0.3046 9137 | 0.2678 4832 | 0.2356 0450 | 27 |
| 28 | 0.3334 7747 | 0.2915 7069 | 0.2550 9364 | 0.2233 2181 | 28 |
| 29 | 0.3206 5141 | 0.2790 1502 | 0.2429 4632 | 0.2116 7944 | 29 |
| 30 | 0.3083 1867 | 0.2670 0002 | 0.2313 7745 | 0.2006 4402 | 30 |
| 31 | 0.2964 6026 | 0.2555 0241 | 0.2203 5947 | 0.1901 8390 | 31 |
| 32 | 0.2850 5794 | 0.2444 9991 | 0.2098 6617 | 0.1802 6910 | 32 |
| 33 | 0.2740 9417 | 0.2339 7121 | 0.1998 7254 | 0.1708 7119 | 33 |
| 34 | 0.2635 5209 | 0.2238 9589 | 0.1903 5480 | 0.1619 6321 | 34 |
| 35 | 0.2534 1547 | 0.2142 5444 | 0.1812 9029 | 0.1535 1963 | 35 |
| 36 | 0.2436 6872 | 0.2050 2817 | 0.1726 5741 | 0.1455 1624 | 36 |
| 37 | 0.2342 9685 | 0.1961 9921 | 0.1644 3563 | 0.1379 3008 | 37 |
| 38 | 0.2252 8543 | 0.1877 5044 | 0.1566 0536 | 0.1307 3941 | 38 |
| 39 | 0.2166 2061 | 0.1796 6549 | 0.1491 4797 | 0.1239 2362 | 39 |
| 40 | 0.2082 8904 | 0.1719 2870 | 0.1420 4568 | 0.1174 6314 | 40 |
| 41 | 0.2002 7793 | 0.1645 2507 | 0.1352 8160 | 0.1113 3947 | 41 |
| 42 | 0.1925 7493 | 0.1574 4026 | 0.1288 3962 | 0.1055 3504 | 42 |
| 43 | 0.1851 6820 | 0.1506 6054 | 0.1227 0440 | 0.1000 3322 | 43 |
| 44 | 0.1780 4635 | 0.1441 7276 | 0.1168 6133 | 0.0948 1822 | 44 |
| 45 | 0.1711 9841 | 0.1379 6437 | 0.1112 9651 | 0.0898 7509 | 45 |
| 46 | 0.1646 1386 | 0.1320 2332 | 0.1059 9668 | 0.0851 8965 | 46 |
| 47 | 0.1582 8256 | 0.1263 3810 | 0.1009 4921 | 0.0807 4849 | 47 |
| 48 | 0.1521 9476 | 0.1208 9771 | 0.0961 4211 | 0.0765 3885 | 48 |
| 49 | 0.1463 4112 | 0.1156 9158 | 0.0915 6391 | 0.0725 4867 | 49 |
| 50 | 0.1407 1262 | 0.1107 0965 | 0.0872 0373 | 0.0687 6652 | 50 |

# PRESENT VALUE OF 1

$$v^n = (1 + i)^{-n}$$

| $n$ | 6% | 6½% | 7% | 8% | $n$ |
|---|---|---|---|---|---|
| 1 | 0.9433 9623 | 0.9389 6714 | 0.9345 7944 | 0.9259 2593 | 1 |
| 2 | 0.8899 9644 | 0.8816 5928 | 0.8734 3873 | 0.8573 3882 | 2 |
| 3 | 0.8396 1928 | 0.8278 4909 | 0.8162 9788 | 0.7938 3224 | 3 |
| 4 | 0.7920 9366 | 0.7773 2309 | 0.7628 9521 | 0.7350 2985 | 4 |
| 5 | 0.7472 5817 | 0.7298 8084 | 0.7129 8618 | 0.6805 8320 | 5 |
| 6 | 0.7049 6054 | 0.6853 3412 | 0.6663 4222 | 0.6301 6963 | 6 |
| 7 | 0.6650 5711 | 0.6435 0621 | 0.6227 4974 | 0.5834 9040 | 7 |
| 8 | 0.6274 1237 | 0.6042 3119 | 0.5820 0910 | 0.5402 6888 | 8 |
| 9 | 0.5918 9846 | 0.5673 5323 | 0.5439 3374 | 0.5002 4897 | 9 |
| 10 | 0.5583 9478 | 0.5327 2604 | 0.5083 4929 | 0.4631 9349 | 10 |
| 11 | 0.5267 8753 | 0.5002 1224 | 0.4750 9280 | 0.4288 8286 | 11 |
| 12 | 0.4969 6936 | 0.4696 8285 | 0.4440 1196 | 0.3971 1376 | 12 |
| 13 | 0.4688 3902 | 0.4410 1676 | 0.4149 6445 | 0.3676 9792 | 13 |
| 14 | 0.4423 0096 | 0.4141 0025 | 0.3878 1724 | 0.3404 6104 | 14 |
| 15 | 0.4172 6506 | 0.3888 2652 | 0.3624 4602 | 0.3152 4170 | 15 |
| 16 | 0.3936 4628 | 0.3650 9533 | 0.3387 3460 | 0.2918 9047 | 16 |
| 17 | 0.3713 6442 | 0.3428 1251 | 0.3165 7439 | 0.2702 6895 | 17 |
| 18 | 0.3503 4379 | 0.3218 8969 | 0.2958 6392 | 0.2502 4903 | 18 |
| 19 | 0.3305 1301 | 0.3022 4384 | 0.2765 0833 | 0.2317 1206 | 19 |
| 20 | 0.3118 0473 | 0.2837 9703 | 0.2584 1900 | 0.2145 4821 | 20 |
| 21 | 0.2941 5540 | 0.2664 7608 | 0.2415 1309 | 0.1986 5575 | 21 |
| 22 | 0.2775 0510 | 0.2502 1228 | 0.2257 1317 | 0.1839 4051 | 22 |
| 23 | 0.2617 9726 | 0.2349 4111 | 0.2109 4688 | 0.1703 1528 | 23 |
| 24 | 0.2469 7855 | 0.2206 0198 | 0.1971 4662 | 0.1576 9934 | 24 |
| 25 | 0.2329 9863 | 0.2071 3801 | 0.1842 4918 | 0.1460 1790 | 25 |
| 26 | 0.2198 1003 | 0.1944 9579 | 0.1721 9549 | 0.1352 0176 | 26 |
| 27 | 0.2073 6795 | 0.1826 2515 | 0.1609 3037 | 0.1251 8682 | 27 |
| 28 | 0.1956 3014 | 0.1714 7902 | 0.1504 0221 | 0.1159 1372 | 28 |
| 29 | 0.1845 5674 | 0.1610 1316 | 0.1405 6282 | 0.1073 2752 | 29 |
| 30 | 0.1741 1013 | 0.1511 8607 | 0.1313 6712 | 0.0993 7733 | 30 |
| 31 | 0.1642 5484 | 0.1419 5875 | 0.1227 7301 | 0.0920 1605 | 31 |
| 32 | 0.1549 5740 | 0.1332 9460 | 0.1147 4113 | 0.0852 0005 | 32 |
| 33 | 0.1461 8622 | 0.1251 5925 | 0.1072 3470 | 0.0788 8893 | 33 |
| 34 | 0.1379 1153 | 0.1175 2042 | 0.1002 1934 | 0.0730 4531 | 34 |
| 35 | 0.1301 0522 | 0.1103 4781 | 0.0936 6294 | 0.0676 3454 | 35 |
| 36 | 0.1227 4077 | 0.1036 1297 | 0.0875 3546 | 0.0626 2458 | 36 |
| 37 | 0.1157 9318 | 0.0972 8917 | 0.0818 0884 | 0.0579 8572 | 37 |
| 38 | 0.1092 3885 | 0.0913 5134 | 0.0764 5686 | 0.0536 9048 | 38 |
| 39 | 0.1030 5552 | 0.0857 7590 | 0.0714 5501 | 0.0497 1341 | 39 |
| 40 | 0.0972 2219 | 0.0805 4075 | 0.0667 8038 | 0.0460 3093 | 40 |
| 41 | 0.0917 1905 | 0.0756 2512 | 0.0624 1157 | 0.0426 2123 | 41 |
| 42 | 0.0865 2740 | 0.0710 0950 | 0.0583 2857 | 0.0394 6411 | 42 |
| 43 | 0.0816 2962 | 0.0666 7559 | 0.0545 1268 | 0.0365 4084 | 43 |
| 44 | 0.0770 0908 | 0.0626 0619 | 0.0509 4643 | 0.0338 3411 | 44 |
| 45 | 0.0726 5007 | 0.0587 8515 | 0.0476 1349 | 0.0313 2788 | 45 |
| 46 | 0.0685 3781 | 0.0551 9733 | 0.0444 9859 | 0.0290 0730 | 46 |
| 47 | 0.0646 5831 | 0.0518 2848 | 0.0415 8747 | 0.0268 5861 | 47 |
| 48 | 0.0609 9840 | 0.0486 6524 | 0.0388 6679 | 0.0248 6908 | 48 |
| 49 | 0.0575 4566 | 0.0456 9506 | 0.0363 2410 | 0.0230 2693 | 49 |
| 50 | 0.0542 8836 | 0.0429 0616 | 0.0339 4776 | 0.0213 2123 | 50 |

# AMOUNT OF ANNUITY OF 1 PER PERIOD

$$s_{\overline{n}|i} = \frac{(1+i)^n - 1}{i}$$

| $n$ | $\frac{1}{4}\%$ | $\frac{7}{24}\%$ | $\frac{1}{3}\%$ | $\frac{3}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 1.0000 0000 | 1.0000 0000 | 1.0000 0000 | 1.0000 0000 | 1 |
| 2 | 2.0025 0000 | 2.0029 1667 | 2.0033 3333 | 2.0037 5000 | 2 |
| 3 | 3.0075 0625 | 3.0087 5851 | 3.0100 1111 | 3.0112 6406 | 3 |
| 4 | 4.0150 2502 | 4.0175 3405 | 4.0200 4448 | 4.0225 5630 | 4 |
| 5 | 5.0250 6258 | 5.0292 5186 | 5.0334 4463 | 5.0376 4089 | 5 |
| 6 | 6.0376 2523 | 6.0439 2051 | 6.0502 2278 | 6.0565 3204 | 6 |
| 7 | 7.0527 1930 | 7.0615 4861 | 7.0703 9019 | 7.0792 4404 | 7 |
| 8 | 8.0703 5110 | 8.0821 4480 | 8.0939 5816 | 8.1057 9120 | 8 |
| 9 | 9.0905 2697 | 9.1057 1772 | 9.1209 3802 | 9.1361 8792 | 9 |
| 10 | 10.1132 5329 | 10.1322 7606 | 10.1513 4114 | 10.1704 4862 | 10 |
| 11 | 11.1385 3642 | 11.1618 2853 | 11.1851 7895 | 11.2085 8781 | 11 |
| 12 | 12.1663 8277 | 12.1943 8387 | 12.2224 6288 | 12.2506 2001 | 12 |
| 13 | 13.1967 9872 | 13.2299 5082 | 13.2632 0442 | 13.2965 5984 | 13 |
| 14 | 14.2297 9072 | 14.2685 3818 | 14.3074 1510 | 14.3464 2194 | 14 |
| 15 | 15.2653 6520 | 15.3101 5475 | 15.3551 0648 | 15.4002 2102 | 15 |
| 16 | 16.3035 2861 | 16.3548 0936 | 16.4062 9017 | 16.4579 7185 | 16 |
| 17 | 17.3442 8743 | 17.4025 1089 | 17.4609 7781 | 17.5196 8924 | 17 |
| 18 | 18.3876 4815 | 18.4532 6822 | 18.5191 8107 | 18.5853 8808 | 18 |
| 19 | 19.4336 1727 | 19.5070 9025 | 19.5809 1167 | 19.6550 8328 | 19 |
| 20 | 20.4822 0131 | 20.5639 8593 | 20.6461 8137 | 20.7287 8984 | 20 |
| 21 | 21.5334 0682 | 21.6239 6422 | 21.7150 0198 | 21.8065 2280 | 21 |
| 22 | 22.5872 4033 | 22.6870 3412 | 22.7873 8532 | 22.8882 9727 | 22 |
| 23 | 23.6437 0843 | 23.7532 0463 | 23.8633 4327 | 23.9741 2838 | 23 |
| 24 | 24.7028 1770 | 24.8224 8481 | 24.9428 8775 | 25.0640 3136 | 24 |
| 25 | 25.7645 7475 | 25.8948 8373 | 26.0260 3071 | 26.1580 2148 | 25 |
| 26 | 26.8289 8619 | 26.9704 1047 | 27.1127 8414 | 27.2561 1406 | 26 |
| 27 | 27.8960 5865 | 28.0490 7417 | 28.2031 6009 | 28.3583 2449 | 27 |
| 28 | 28.9657 9880 | 29.1308 8397 | 29.2971 7062 | 29.4646 6820 | 28 |
| 29 | 30.0382 1330 | 30.2158 4904 | 30.3948 2786 | 30.5751 6071 | 29 |
| 30 | 31.1133 0883 | 31.3039 7860 | 31.4961 4395 | 31.6898 1756 | 30 |
| 31 | 32.1910 9210 | 32.3952 8188 | 32.6011 3110 | 32.8086 5438 | 31 |
| 32 | 33.2715 6983 | 33.4897 6811 | 33.7098 0154 | 33.9316 8683 | 32 |
| 33 | 34.3547 4876 | 34.5874 4660 | 34.8221 6754 | 35.0589 3066 | 33 |
| 34 | 35.4406 3563 | 35.6883 2666 | 35.9382 4143 | 36.1904 0165 | 34 |
| 35 | 36.5292 3722 | 36.7924 1761 | 37.0580 3557 | 37.3261 1565 | 35 |
| 36 | 37.6205 6031 | 37.8997 2883 | 38.1815 6236 | 38.4660 8859 | 36 |
| 37 | 38.7146 1171 | 39.0102 6970 | 39.3088 3423 | 39.6103 3642 | 37 |
| 38 | 39.8113 9824 | 40.1240 4966 | 40.4398 6368 | 40.7588 7518 | 38 |
| 39 | 40.9109 2673 | 41.2410 7814 | 41.5746 6322 | 41.9117 2096 | 39 |
| 40 | 42.0132 0405 | 42.3613 6461 | 42.7132 4543 | 43.0688 8992 | 40 |
| 41 | 43.1182 3706 | 43.4849 1859 | 43.8556 2292 | 44.2303 9825 | 41 |
| 42 | 44.2260 3265 | 44.6117 4961 | 45.0018 0833 | 45.3962 6225 | 42 |
| 43 | 45.3365 9774 | 45.7418 6721 | 46.1518 1436 | 46.5664 9823 | 43 |
| 44 | 46.4499 3923 | 46.8752 8099 | 47.3056 5374 | 47.7411 2260 | 44 |
| 45 | 47.5660 6408 | 48.0120 0056 | 48.4633 3925 | 48.9201 5181 | 45 |
| 46 | 48.6849 7924 | 49.1520 3556 | 49.6248 8371 | 50.1036 0238 | 46 |
| 47 | 49.8066 9169 | 50.2953 9566 | 50.7902 9999 | 51.2914 9089 | 47 |
| 48 | 50.9312 0842 | 51.4420 9057 | 51.9596 0099 | 52.4838 3398 | 48 |
| 49 | 52.0585 3644 | 52.5921 3000 | 53.1327 9966 | 53.6806 4836 | 49 |
| 50 | 53.1886 8278 | 53.7455 2371 | 54.3099 0899 | 54.8819 5079 | 50 |

## AMOUNT OF ANNUITY OF 1 PER PERIOD

$$s_{\overline{n}|i} = \frac{(1+i)^n - 1}{i}$$

| $n$ | $\frac{5}{12}\%$ | $\frac{1}{2}\%$ | $\frac{7}{12}\%$ | $\frac{5}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 1.0000 0000 | 1.0000 0000 | 1.0000 0000 | 1.0000 0000 | 1 |
| 2 | 2.0041 6667 | 2.0050 0000 | 2.0058 3333 | 2.0062 5000 | 2 |
| 3 | 3.0125 1736 | 3.0150 2500 | 3.0175 3403 | 3.0187 8906 | 3 |
| 4 | 4.0250 6952 | 4.0301 0013 | 4.0351 3631 | 4.0376 5649 | 4 |
| 5 | 5.0418 4064 | 5.0502 5063 | 5.0586 7460 | 5.0628 9185 | 5 |
| 6 | 6.0628 4831 | 6.0755 0188 | 6.0881 8354 | 6.0945 3492 | 6 |
| 7 | 7.0881 1018 | 7.1058 7939 | 7.1236 9794 | 7.1326 2576 | 7 |
| 8 | 8.1176 4397 | 8.1414 0879 | 8.1652 5285 | 8.1772 0468 | 8 |
| 9 | 9.1514 6749 | 9.1821 1583 | 9.2128 8349 | 9.2283 1220 | 9 |
| 10 | 10.1895 9860 | 10.2280 2641 | 10.2666 2531 | 10.2859 8916 | 10 |
| 11 | 11.2320 5526 | 11.2791 6654 | 11.3265 1396 | 11.3502 7659 | 11 |
| 12 | 12.2788 5549 | 12.3355 6237 | 12.3925 8529 | 12.4212 1582 | 12 |
| 13 | 13.3300 1739 | 13.3972 4018 | 13.4648 7537 | 13.4988 4842 | 13 |
| 14 | 14.3855 5913 | 14.4642 2639 | 14.5434 2048 | 14.5832 1622 | 14 |
| 15 | 15.4454 9896 | 15.5365 4752 | 15.6282 5710 | 15.6743 6132 | 15 |
| 16 | 16.5098 5520 | 16.6142 3026 | 16.7194 2193 | 16.7723 2608 | 16 |
| 17 | 17.5786 4627 | 17.6973 0141 | 17.8169 5189 | 17.8771 5312 | 17 |
| 18 | 18.6518 9063 | 18.7857 8791 | 18.9208 8411 | 18.9888 8532 | 18 |
| 19 | 19.7296 0684 | 19.8797 1685 | 20.0312 5593 | 20.1075 6586 | 19 |
| 20 | 20.8118 1353 | 20.9791 1544 | 21.1481 0493 | 21.2332 3814 | 20 |
| 21 | 21.8985 2942 | 22.0840 1101 | 22.2714 6887 | 22.3659 4588 | 21 |
| 22 | 22.9897 7330 | 23.1944 3107 | 23.4013 8577 | 23.5057 3304 | 22 |
| 23 | 24.0855 6402 | 24.3104 0322 | 24.5378 9386 | 24.6526 4387 | 23 |
| 24 | 25.1859 2053 | 25.4319 5524 | 25.6810 3157 | 25.8067 2290 | 24 |
| 25 | 26.2908 6187 | 26.5591 1502 | 26.8308 3759 | 26.9680 1492 | 25 |
| 26 | 27.4004 0713 | 27.6919 1059 | 27.9873 5081 | 28.1365 6501 | 26 |
| 27 | 28.5145 7549 | 28.8303 7015 | 29.1506 1035 | 29.3124 1854 | 27 |
| 28 | 29.6333 8622 | 29.9745 2200 | 30.3206 5558 | 30.4956 2116 | 28 |
| 29 | 30.7568 5866 | 31.1243 9461 | 31.4975 2607 | 31.6862 1879 | 29 |
| 30 | 31.8850 1224 | 32.2800 1658 | 32.6812 6164 | 32.8842 5766 | 30 |
| 31 | 33.0178 6646 | 33.4414 1666 | 33.8719 0233 | 34.0897 8427 | 31 |
| 32 | 34.1554 4090 | 34.6086 2375 | 35.0694 8843 | 35.3028 4542 | 32 |
| 33 | 35.2977 5524 | 35.7816 6686 | 36.2740 6045 | 36.5234 8820 | 33 |
| 34 | 36.4448 2922 | 36.9605 7520 | 37.4856 5913 | 37.7517 6003 | 34 |
| 35 | 37.5966 8268 | 38.1453 7807 | 38.7043 2548 | 38.9877 0850 | 35 |
| 36 | 38.7533 3552 | 39.3361 0496 | 39.9301 0071 | 40.2313 8168 | 36 |
| 37 | 39.9148 0775 | 40.5327 8549 | 41.1630 2630 | 41.4828 2782 | 37 |
| 38 | 41.0811 1945 | 41.7354 4942 | 42.4031 4395 | 42.7420 9549 | 38 |
| 39 | 42.2522 9078 | 42.9441 2666 | 43.6504 9562 | 44.0092 3359 | 39 |
| 40 | 43.4283 4199 | 44.1588 4730 | 44.9051 2352 | 45.2842 9130 | 40 |
| 41 | 44.6092 9342 | 45.3796 4153 | 46.1670 7007 | 46.5673 1812 | 41 |
| 42 | 45.7951 6547 | 46.6065 3974 | 47.4363 7798 | 47.8583 6386 | 42 |
| 43 | 46.9859 7866 | 47.8395 7244 | 48.7130 9018 | 49.1574 7863 | 43 |
| 44 | 48.1817 5357 | 49.0787 7030 | 49.9972 4988 | 50.4647 1287 | 44 |
| 45 | 49.3825 1088 | 50.3241 6415 | 51.2889 0050 | 51.7801 1733 | 45 |
| 46 | 50.5882 7134 | 51.5757 8497 | 52.5880 8575 | 53.1037 4306 | 46 |
| 47 | 51.7990 5581 | 52.8336 6390 | 53.8948 4959 | 54.4356 4146 | 47 |
| 48 | 53.0148 8521 | 54.0978 3222 | 55.2092 3621 | 55.7758 6421 | 48 |
| 49 | 54.2357 8056 | 55.3683 2138 | 56.5312 9009 | 57.1244 6337 | 49 |
| 50 | 55.4617 6298 | 56.6451 6299 | 57.8610 5595 | 58.4814 9126 | 50 |

# AMOUNT OF ANNUITY OF 1 PER PERIOD

$$s_{\overline{n}|i} = \frac{(1+i)^n - 1}{i}$$

| $n$ | $\frac{3}{4}\%$ | $\frac{7}{8}\%$ | $1\%$ | $1\frac{1}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 1.0000 0000 | 1.0000 0000 | 1.0000 0000 | 1.0000 0000 | 1 |
| 2 | 2.0075 0000 | 2.0087 5000 | 2.0100 0000 | 2.0112 5000 | 2 |
| 3 | 3.0225 5625 | 3.0263 2656 | 3.0301 0000 | 3.0338 7656 | 3 |
| 4 | 4.0452 2542 | 4.0528 0692 | 4.0604 0100 | 4.0680 0767 | 4 |
| 5 | 5.0755 6461 | 5.0882 6898 | 5.1010 0501 | 5.1137 7276 | 5 |
| 6 | 6.1136 3135 | 6.1327 9133 | 6.1520 1506 | 6.1713 0270 | 6 |
| 7 | 7.1594 8358 | 7.1864 5326 | 7.2135 3521 | 7.2407 2986 | 7 |
| 8 | 8.2131 7971 | 8.2493 3472 | 8.2856 7056 | 8.3221 8807 | 8 |
| 9 | 9.2747 7856 | 9.3215 1640 | 9.3685 2727 | 9.4158 1269 | 9 |
| 10 | 10.3443 3940 | 10.4030 7967 | 10.4622 1254 | 10.5217 4058 | 10 |
| 11 | 11.4219 2194 | 11.4941 0662 | 11.5668 3467 | 11.6401 1016 | 11 |
| 12 | 12.5075 8636 | 12.5946 8005 | 12.6825 0301 | 12.7710 6140 | 12 |
| 13 | 13.6013 9325 | 13.7048 8350 | 13.8093 2804 | 13.9147 3584 | 13 |
| 14 | 14.7034 0370 | 14.8248 0123 | 14.9474 2132 | 15.0712 7662 | 14 |
| 15 | 15.8136 7923 | 15.9545 1824 | 16.0968 9554 | 16.2408 2848 | 15 |
| 16 | 16.9322 8183 | 17.0941 2028 | 17.2578 6449 | 17.4235 3780 | 16 |
| 17 | 18.0592 7394 | 18.2436 9383 | 18.4304 4314 | 18.6195 5260 | 17 |
| 18 | 19.1947 1849 | 19.4033 2615 | 19.6147 4757 | 19.8290 2257 | 18 |
| 19 | 20.3386 7888 | 20.5731 0526 | 20.8108 9504 | 21.0520 9907 | 19 |
| 20 | 21.4912 1897 | 21.7531 1993 | 22.0190 0399 | 22.2889 3519 | 20 |
| 21 | 22.6524 0312 | 22.9434 5973 | 23.2391 9403 | 23.5396 8571 | 21 |
| 22 | 23.8222 9614 | 24.1442 1500 | 24.4715 8598 | 24.8045 0717 | 22 |
| 23 | 25.0009 6336 | 25.3554 7688 | 25.7163 0183 | 26.0835 5788 | 23 |
| 24 | 26.1884 7059 | 26.5773 3730 | 26.9734 6485 | 27.3769 9790 | 24 |
| 25 | 27.3848 8412 | 27.8098 8900 | 28.2431 9950 | 28.6849 8913 | 25 |
| 26 | 28.5902 7075 | 29.0532 2553 | 29.5256 3150 | 30.0076 9526 | 26 |
| 27 | 29.8046 9778 | 30.3074 4126 | 30.8208 8781 | 31.3452 8183 | 27 |
| 28 | 31.0282 3301 | 31.5726 3137 | 32.1290 9669 | 32.6979 1625 | 28 |
| 29 | 32.2609 4476 | 32.8488 9189 | 33.4503 8766 | 34.0657 6781 | 29 |
| 30 | 33.5029 0184 | 34.1363 1970 | 34.7848 9153 | 35.4490 0769 | 30 |
| 31 | 34.7541 7361 | 35.4350 1249 | 36.1327 4045 | 36.8478 0903 | 31 |
| 32 | 36.0148 2991 | 36.7450 6885 | 37.4940 6785 | 38.2623 4688 | 32 |
| 33 | 37.2849 4113 | 38.0665 8820 | 38.8690 0853 | 39.6927 9829 | 33 |
| 34 | 38.5645 7819 | 39.3996 7085 | 40.2576 9862 | 41.1393 4227 | 34 |
| 35 | 39.8538 1253 | 40.7444 1797 | 41.6602 7560 | 42.6021 5987 | 35 |
| 36 | 41.1527 1612 | 42.1009 3163 | 43.0768 7836 | 44.0814 3417 | 36 |
| 37 | 42.4613 6149 | 43.4693 1478 | 44.5076 4714 | 45.5773 5030 | 37 |
| 38 | 43.7798 2170 | 44.8496 7128 | 45.9527 2361 | 47.0900 9549 | 38 |
| 39 | 45.1081 7037 | 46.2421 0591 | 47.4122 5085 | 48.6198 5906 | 39 |
| 40 | 46.4464 8164 | 47.6467 2433 | 48.8863 7336 | 50.1668 3248 | 40 |
| 41 | 47.7948 3026 | 49.0636 3317 | 50.3752 3709 | 51.7312 0934 | 41 |
| 42 | 49.1532 9148 | 50.4929 3996 | 51.8789 8946 | 53.3131 8545 | 42 |
| 43 | 50.5219 4117 | 51.9347 5319 | 53.3977 7936 | 54.9129 5879 | 43 |
| 44 | 51.9008 5573 | 53.3891 8228 | 54.9317 5715 | 56.5307 2957 | 44 |
| 45 | 53.2901 1215 | 54.8563 3762 | 56.4810 7472 | 58.1667 0028 | 45 |
| 46 | 54.6897 8799 | 56.3363 3058 | 58.0458 8547 | 59.8210 7566 | 46 |
| 47 | 56.0999 6140 | 57.8292 7347 | 59.6263 4432 | 61.4940 6276 | 47 |
| 48 | 57.5207 1111 | 59.3352 7961 | 61.2226 0777 | 63.1858 7097 | 48 |
| 49 | 58.9521 1644 | 60.8544 6331 | 62.8348 3385 | 64.8967 1201 | 49 |
| 50 | 60.3942 5732 | 62.3869 3986 | 64.4631 8218 | 66.6268 0002 | 50 |

# AMOUNT OF ANNUITY OF 1 PER PERIOD

$$s_{\overline{n}|i} = \frac{(1+i)^n - 1}{i}$$

| $n$ | $1\frac{1}{4}\%$ | $1\frac{3}{8}\%$ | $1\frac{1}{2}\%$ | $1\frac{5}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 1.0000 0000 | 1.0000 0000 | 1.0000 0000 | 1.0000 0000 | 1 |
| 2 | 2.0125 0000 | 2.0137 5000 | 2.0150 0000 | 2.0162 5000 | 2 |
| 3 | 3.0376 5625 | 3.0414 3906 | 3.0452 2500 | 3.0490 1406 | 3 |
| 4 | 4.0756 2695 | 4.0832 5885 | 4.0909 0338 | 4.0985 6054 | 4 |
| 5 | 5.1265 7229 | 5.1394 0366 | 5.1522 6693 | 5.1651 6215 | 5 |
| 6 | 6.1906 5444 | 6.2100 7046 | 6.2295 5093 | 6.2490 9603 | 6 |
| 7 | 7.2680 3762 | 7.2954 5893 | 7.3229 9419 | 7.3506 4385 | 7 |
| 8 | 8.3588 8809 | 8.3957 7149 | 8.4328 3911 | 8.4700 9181 | 8 |
| 9 | 9.4633 7420 | 9.5112 1335 | 9.5593 3169 | 9.6077 3080 | 9 |
| 10 | 10.5816 6637 | 10.6419 9253 | 10.7027 2167 | 10.7638 5643 | 10 |
| 11 | 11.7139 3720 | 11.7883 1993 | 11.8632 6249 | 11.9387 6909 | 11 |
| 12 | 12.8603 6142 | 12.9504 0933 | 13.0412 1143 | 13.1327 7409 | 12 |
| 13 | 14.0211 1594 | 14.1284 7745 | 14.2368 2960 | 14.3461 8167 | 13 |
| 14 | 15.1963 7988 | 15.3227 4402 | 15.4503 8205 | 15.5793 0712 | 14 |
| 15 | 16.3863 3463 | 16.5334 3175 | 16.6821 3778 | 16.8324 7086 | 15 |
| 16 | 17.5911 6382 | 17.7607 6644 | 17.9323 6984 | 18.1059 9851 | 16 |
| 17 | 18.8110 5336 | 19.0049 7697 | 19.2013 5539 | 19.4002 2099 | 17 |
| 18 | 20.0461 9153 | 20.2662 9541 | 20.4893 7572 | 20.7154 7458 | 18 |
| 19 | 21.2967 6893 | 21.5449 5697 | 21.7967 1636 | 22.0521 0104 | 19 |
| 20 | 22.5629 7854 | 22.8412 0013 | 23.1236 6710 | 23.4104 4768 | 20 |
| 21 | 23.8450 1577 | 24.1552 6663 | 24.4705 2211 | 24.7908 6746 | 21 |
| 22 | 25.1430 7847 | 25.4874 0155 | 25.8375 7994 | 26.1937 1905 | 22 |
| 23 | 26.4573 6695 | 26.8378 5332 | 27.2251 4364 | 27.6193 6699 | 23 |
| 24 | 27.7880 8403 | 28.2068 7380 | 28.6335 2080 | 29.0681 8170 | 24 |
| 25 | 29.1354 3508 | 29.5947 1832 | 30.0630 2361 | 30.5405 3966 | 25 |
| 26 | 30.4996 2802 | 31.0016 4569 | 31.5139 6896 | 32.0368 2343 | 26 |
| 27 | 31.8808 7337 | 32.4279 1832 | 32.9866 7850 | 33.5574 2181 | 27 |
| 28 | 33.2793 8429 | 33.8738 0220 | 34.4814 7867 | 35.1027 2991 | 28 |
| 29 | 34.6953 7659 | 35.3395 6698 | 35.9987 0085 | 36.6731 4927 | 29 |
| 30 | 36.1290 6880 | 36.8254 8602 | 37.5386 8137 | 38.2690 8795 | 30 |
| 31 | 37.5806 8216 | 38.3318 3646 | 39.1017 6159 | 39.8909 6063 | 31 |
| 32 | 39.0504 4069 | 39.8588 9921 | 40.6882 8801 | 41.5391 8874 | 32 |
| 33 | 40.5385 7120 | 41.4069 5907 | 42.2986 1233 | 43.2142 0055 | 33 |
| 34 | 42.0453 0334 | 42.9763 0476 | 43.9330 9152 | 44.9164 3131 | 34 |
| 35 | 43.5708 6963 | 44.5672 2895 | 45.5920 8789 | 46.6463 2332 | 35 |
| 36 | 45.1155 0550 | 46.1800 2835 | 47.2759 6921 | 48.4043 2607 | 36 |
| 37 | 46.6794 4932 | 47.8150 0374 | 48.9851 0874 | 50.1908 9637 | 37 |
| 38 | 48.2629 4243 | 49.4724 6004 | 50.7198 8538 | 52.0064 9844 | 38 |
| 39 | 49.8662 2921 | 51.1527 0636 | 52.4806 8366 | 53.8516 0404 | 39 |
| 40 | 51.4895 5708 | 52.8560 5608 | 54.2678 9391 | 55.7266 9261 | 40 |
| 41 | 53.1331 7654 | 54.5828 2685 | 56.0819 1232 | 57.6322 5136 | 41 |
| 42 | 54.7973 4125 | 56.3333 4072 | 57.9231 4100 | 59.5687 7544 | 42 |
| 43 | 56.4823 0801 | 58.1079 2415 | 59.7919 8812 | 61.5367 6805 | 43 |
| 44 | 58.1883 3687 | 59.9069 0811 | 61.6888 6794 | 63.5367 4053 | 44 |
| 45 | 59.9156 9108 | 61.7306 2810 | 63.6142 0096 | 65.5692 1256 | 45 |
| 46 | 61.6646 3721 | 63.5794 2423 | 65.5684 1398 | 67.6347 1226 | 46 |
| 47 | 63.4354 4518 | 65.4536 4131 | 67.5519 4018 | 69.7337 7634 | 47 |
| 48 | 65.2283 8824 | 67.3536 2888 | 69.5652 1929 | 71.8669 5020 | 48 |
| 49 | 67.0437 4310 | 69.2797 4128 | 71.6086 9758 | 74.0347 8814 | 49 |
| 50 | 68.8817 8989 | 71.2323 3772 | 73.6828 2804 | 76.2378 5345 | 50 |

# AMOUNT OF ANNUITY OF 1 PER PERIOD

$$s_{\overline{n}|i} = \frac{(1+i)^n - 1}{i}$$

| $n$ | $1\frac{3}{4}\%$ | $2\%$ | $2\frac{1}{4}\%$ | $2\frac{1}{2}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 1.0000 0000 | 1.0000 0000 | 1.0000 0000 | 1.0000 0000 | 1 |
| 2 | 2.0175 0000 | 2.0200 0000 | 2.0225 0000 | 2.0250 0000 | 2 |
| 3 | 3.0528 0625 | 3.0604 0000 | 3.0680 0625 | 3.0756 2500 | 3 |
| 4 | 4.1062 3036 | 4.1216 0800 | 4.1370 3639 | 4.1525 1563 | 4 |
| 5 | 5.1780 8939 | 5.2040 4016 | 5.2301 1971 | 5.2563 2852 | 5 |
| 6 | 6.2687 0596 | 6.3081 2096 | 6.3477 9740 | 6.3877 3673 | 6 |
| 7 | 7.3784 0831 | 7.4342 8338 | 7.4906 2284 | 7.5474 3015 | 7 |
| 8 | 8.5075 3045 | 8.5829 6905 | 8.6591 6186 | 8.7361 1590 | 8 |
| 9 | 9.6564 1224 | 9.7546 2843 | 9.8539 9300 | 9.9545 1880 | 9 |
| 10 | 10.8253 9945 | 10.9497 2100 | 11.0757 0784 | 11.2033 8177 | 10 |
| 11 | 12.0148 4394 | 12.1687 1542 | 12.3249 1127 | 12.4834 6631 | 11 |
| 12 | 13.2251 0371 | 13.4120 8973 | 13.6022 2177 | 13.7955 5297 | 12 |
| 13 | 14.4565 4303 | 14.6803 3152 | 14.9082 7176 | 15.1404 4179 | 13 |
| 14 | 15.7095 3253 | 15.9739 3815 | 16.2437 0788 | 16.5189 5284 | 14 |
| 15 | 16.9844 4935 | 17.2934 1692 | 17.6091 9130 | 17.9319 2666 | 15 |
| 16 | 18.2816 7721 | 18.6392 8525 | 19.0053 9811 | 19.3802 2483 | 16 |
| 17 | 19.6016 0656 | 20.0120 7096 | 20.4330 1957 | 20.8647 3045 | 17 |
| 18 | 20.9446 3468 | 21.4123 1238 | 21.8927 6251 | 22.3863 4871 | 18 |
| 19 | 22.3111 6578 | 22.8405 5863 | 23.3853 4966 | 23.9460 0743 | 19 |
| 20 | 23.7016 1119 | 24.2973 6980 | 24.9115 2003 | 25.5446 5761 | 20 |
| 21 | 25.1163 8938 | 25.7833 1719 | 26.4720 2923 | 27.1832 7405 | 21 |
| 22 | 26.5559 2620 | 27.2989 8354 | 28.0676 4989 | 28.8628 5590 | 22 |
| 23 | 28.0206 5490 | 28.8449 6321 | 29.6991 7201 | 30.5844 2730 | 23 |
| 24 | 29.5110 1637 | 30.4218 6247 | 31.3674 0338 | 32.3490 3798 | 24 |
| 25 | 31.0274 5915 | 32.0302 9972 | 33.0731 6996 | 34.1577 6393 | 25 |
| 26 | 32.5704 3969 | 33.6709 0572 | 34.8173 1628 | 36.0117 0803 | 26 |
| 27 | 34.1404 2238 | 35.3443 2383 | 36.6007 0590 | 37.9120 0073 | 27 |
| 28 | 35.7378 7977 | 37.0512 1031 | 38.4242 2178 | 39.8598 0075 | 28 |
| 29 | 37.3632 9267 | 38.7922 3451 | 40.2887 6677 | 41.8562 9577 | 29 |
| 30 | 39.0171 5029 | 40.5680 7921 | 42.1952 6402 | 43.9027 0316 | 30 |
| 31 | 40.6999 5042 | 42.3794 4079 | 44.1446 5746 | 46.0002 7074 | 31 |
| 32 | 42.4121 9955 | 44.2270 2961 | 46.1379 1226 | 48.1502 7751 | 32 |
| 33 | 44.1544 1305 | 46.1115 7020 | 48.1760 1528 | 50.3540 3445 | 33 |
| 34 | 45.9271 1527 | 48.0338 0160 | 50.2599 7563 | 52.6128 8531 | 34 |
| 35 | 47.7308 3979 | 49.9944 7763 | 52.3908 2508 | 54.9282 0744 | 35 |
| 36 | 49.5661 2949 | 51.9943 6719 | 54.5696 1864 | 57.3014 1263 | 36 |
| 37 | 51.4335 3675 | 54.0342 5453 | 56.7974 3506 | 59.7339 4794 | 37 |
| 38 | 53.3336 2365 | 56.1149 3962 | 59.0753 7735 | 62.2272 9664 | 38 |
| 39 | 55.2669 6206 | 58.2372 3841 | 61.4045 7334 | 64.7829 7906 | 39 |
| 40 | 57.2341 3390 | 60.4019 8318 | 63.7861 7624 | 67.4025 5354 | 40 |
| 41 | 59.2357 3124 | 62.6100 2284 | 66.2213 6521 | 70.0876 1737 | 41 |
| 42 | 61.2723 5654 | 64.8622 2330 | 68.7113 4592 | 72.8398 0781 | 42 |
| 43 | 63.3446 2278 | 67.1594 6777 | 71.2573 5121 | 75.6608 0300 | 43 |
| 44 | 65.4531 5367 | 69.5026 5712 | 73.8606 4161 | 78.5523 2308 | 44 |
| 45 | 67.5985 8386 | 71.8927 1027 | 76.5225 0605 | 81.5161 3116 | 45 |
| 46 | 69.7815 5908 | 74.3305 6447 | 79.2442 6243 | 84.5540 3443 | 46 |
| 47 | 72.0027 3637 | 76.8171 7576 | 82.0272 5834 | 87.6678 8530 | 47 |
| 48 | 74.2627 8425 | 79.3535 1927 | 84.8728 7165 | 90.8595 8243 | 48 |
| 49 | 76.5623 8298 | 81.9405 8966 | 87.7825 1126 | 94.1310 7199 | 49 |
| 50 | 78.9022 2468 | 84.5794 0145 | 90.7576 1776 | 97.4843 4879 | 50 |

# AMOUNT OF ANNUITY OF 1 PER PERIOD

$$s_{\overline{n}|i} = \frac{(1+i)^n - 1}{i}$$

| $n$ | $2\frac{3}{4}\%$ | $3\%$ | $3\frac{1}{4}\%$ | $3\frac{1}{2}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 1.0000 0000 | 1.0000 0000 | 1.0000 0000 | 1.0000 0000 | 1 |
| 2 | 2.0275 0000 | 2.0300 0000 | 2.0325 0000 | 2.0350 0000 | 2 |
| 3 | 3.0832 5625 | 3.0909 0000 | 3.0985 5625 | 3.1062 2500 | 3 |
| 4 | 4.1680 4580 | 4.1836 2700 | 4.1992 5933 | 4.2149 4288 | 4 |
| 5 | 5.2826 6706 | 5.3091 3581 | 5.3357 3526 | 5.3624 6588 | 5 |
| 6 | 6.4279 4040 | 6.4684 0988 | 6.5091 4665 | 6.5501 5218 | 6 |
| 7 | 7.6047 0876 | 7.6624 6218 | 7.7206 9392 | 7.7794 0751 | 7 |
| 8 | 8.8138 3825 | 8.8923 3605 | 8.9716 1647 | 9.0516 8677 | 8 |
| 9 | 10.0562 1880 | 10.1591 0613 | 10.2631 9401 | 10.3684 9581 | 9 |
| 10 | 11.3327 6482 | 11.4638 7931 | 11.5967 4781 | 11.7313 9316 | 10 |
| 11 | 12.6444 1585 | 12.8077 9569 | 12.9736 4212 | 13.1419 9192 | 11 |
| 12 | 13.9921 3729 | 14.1920 2956 | 14 3952 8548 | 14.6019 6164 | 12 |
| 13 | 15.3769 2107 | 15.6177 9045 | 15.8631 3226 | 16.1130 3030 | 13 |
| 14 | 16.7997 8639 | 17.0863 2416 | 17.3786 8406 | 17.6769 8636 | 14 |
| 15 | 18.2617 8052 | 18.5989 1389 | 18.9434 9129 | 19.2956 8088 | 15 |
| 16 | 19.7639 7948 | 20.1568 8130 | 20.5591 5476 | 20.9710 2971 | 16 |
| 17 | 21.3074 8892 | 21.7615 8774 | 22.2273 2729 | 22.7050 1575 | 17 |
| 18 | 22.8934 4487 | 23.4144 3537 | 23.9497 1542 | 24.4996 9130 | 18 |
| 19 | 24.5230 1460 | 25.1168 6844 | 25.7280 8118 | 26.3571 8050 | 19 |
| 20 | 26.1973 9750 | 26.8703 7449 | 27.5642 4382 | 28.2796 8181 | 20 |
| 21 | 27.9178 2593 | 28.6764 8572 | 29.4600 8174 | 30.2694 7068 | 21 |
| 22 | 29.6855 6615 | 30.5367 8030 | 31.4175 3440 | 32.3289 0215 | 22 |
| 23 | 31.5019 1921 | 32.4528 8370 | 33.4386 0426 | 34.4604 1373 | 23 |
| 24 | 33.3682 2199 | 34.4264 7022 | 35.5253 5890 | 36.6665 2821 | 24 |
| 25 | 35.2858 4810 | 36.4592 6432 | 37.6799 3307 | 38.9498 5669 | 25 |
| 26 | 37.2562 0892 | 38.5530 4225 | 39.9045 3089 | 41.3131 0168 | 26 |
| 27 | 39.2807 5467 | 40.7096 3352 | 42.2014 2815 | 43.7590 6024 | 27 |
| 28 | 41.3609 7542 | 42.9309 2252 | 44.5729 7456 | 46.2906 2734 | 28 |
| 29 | 43.4984 0224 | 45.2188 5020 | 47.0215 9623 | 48.9107 9930 | 29 |
| 30 | 45.6946 0830 | 47.5754 1571 | 49.5497 9811 | 51.6226 7728 | 30 |
| 31 | 47.9512 1003 | 50.0026 7818 | 52.1601 6655 | 54.4294 7098 | 31 |
| 32 | 50.2698 6831 | 52.5027 5852 | 54.8553 7196 | 57.3345 0247 | 32 |
| 33 | 52.6522 8969 | 55.0778 4128 | 57.6381 7155 | 60.3412 1005 | 33 |
| 34 | 55.1002 2765 | 57.7301 7652 | 60.5114 1213 | 63.4531 5240 | 34 |
| 35 | 57.6154 8391 | 60.4620 8181 | 63.4780 3302 | 66.6740 1274 | 35 |
| 36 | 60.1999 0972 | 63.2759 4427 | 66.5410 6909 | 70.0076 0318 | 36 |
| 37 | 62.8554 0724 | 66.1742 2259 | 69.7036 5384 | 73.4578 6930 | 37 |
| 38 | 65.5839 3094 | 69.1594 4927 | 72.9690 2259 | 77.0288 9472 | 38 |
| 39 | 68.3874 8904 | 72.2342 3275 | 76.3405 1582 | 80.7249 0604 | 39 |
| 40 | 71.2681 4499 | 75.4012 5973 | 79.8215 8259 | 84.5502 7775 | 40 |
| 41 | 74.2280 1898 | 78.6632 9753 | 83.4157 8402 | 88.5095 3747 | 41 |
| 42 | 77.2692 8950 | 82.0231 9645 | 87.1267 9700 | 92.6073 7128 | 42 |
| 43 | 80.3941 9496 | 85.4838 9234 | 90.9584 1791 | 96.8486 2928 | 43 |
| 44 | 83.6050 3532 | 89.0484 0911 | 94.9145 6649 | 101.2383 3130 | 44 |
| 45 | 86.9041 7379 | 92.7198 6139 | 98.9992 8990 | 105.7816 7290 | 45 |
| 46 | 90.2940 3857 | 96.5014 5723 | 103.2167 6682 | 110.4840 3145 | 46 |
| 47 | 93.7771 2463 | 100.3965 0095 | 107.5713 1174 | 115.3509 7255 | 47 |
| 48 | 97.3559 9556 | 104.4083 9598 | 112.0673 7937 | 120.3882 5659 | 48 |
| 49 | 101.0332 8544 | 108.5406 4785 | 116.7095 6920 | 125.6018 4557 | 49 |
| 50 | 104.8117 0079 | 112.7968 6729 | 121.5026 3020 | 130.9979 1016 | 50 |

# AMOUNT OF ANNUITY OF 1 PER PERIOD

$$s_{\overline{n}|i} = \frac{(1+i)^n - 1}{i}$$

| $n$ | 4% | 4½% | 5% | 5½% | $n$ |
|---|---|---|---|---|---|
| 1 | 1.0000 0000 | 1.0000 0000 | 1.0000 0000 | 1.0000 0000 | 1 |
| 2 | 2.0400 0000 | 2.0450 0000 | 2.0500 0000 | 2.0550 0000 | 2 |
| 3 | 3.1216 0000 | 3.1370 2500 | 3.1525 0000 | 3.1680 2500 | 3 |
| 4 | 4.2464 6400 | 4.2781 9113 | 4.3101 2500 | 4.3422 6638 | 4 |
| 5 | 5.4163 2256 | 5.4707 0973 | 5.5256 3125 | 5.5810 9103 | 5 |
| 6 | 6.6329 7546 | 6.7168 9166 | 6.8019 1281 | 6.8880 5103 | 6 |
| 7 | 7.8982 9448 | 8.0191 5179 | 8.1420 0845 | 8.2668 9384 | 7 |
| 8 | 9.2142 2626 | 9.3800 1362 | 9.5491 0888 | 9.7215 7300 | 8 |
| 9 | 10.5827 9531 | 10.8021 1423 | 11.0265 6432 | 11.2562 5951 | 9 |
| 10 | 12.0061 0712 | 12.2882 0937 | 12.5778 9254 | 12.8753 5379 | 10 |
| 11 | 13.4863 5141 | 13.8411 7879 | 14.2067 8716 | 14.5834 9825 | 11 |
| 12 | 15.0258 0546 | 15.4640 3184 | 15.9171 2652 | 16.3855 9065 | 12 |
| 13 | 16.6268 3768 | 17.1599 1327 | 17.7129 8285 | 18.2867 9814 | 13 |
| 14 | 18.2919 1119 | 18.9321 0937 | 19.5986 3199 | 20.2925 7203 | 14 |
| 15 | 20.0235 8764 | 20.7840 5429 | 21.5785 6359 | 22.4086 6350 | 15 |
| 16 | 21.8245 3114 | 22.7193 3673 | 23.6574 9177 | 24.6411 3999 | 16 |
| 17 | 23.6975 1239 | 24.7417 0689 | 25.8403 6636 | 26.9964 0269 | 17 |
| 18 | 25.6454 1288 | 26.8550 8370 | 28.1323 8467 | 29.4812 0483 | 18 |
| 19 | 27.6712 2940 | 29.0635 6246 | 30.5390 0391 | 32.1026 7110 | 19 |
| 20 | 29.7780 7858 | 31.3714 2277 | 33.0659 5410 | 34.8683 1801 | 20 |
| 21 | 31.9692 0172 | 33.7831 3680 | 35.7192 5181 | 37.7860 7550 | 21 |
| 22 | 34.2479 6979 | 36.3033 7795 | 38.5052 1440 | 40.8643 0965 | 22 |
| 23 | 36.6178 8858 | 38.9370 2996 | 41.4304 7512 | 44.1118 4669 | 23 |
| 24 | 39.0826 0412 | 41.6891 9631 | 44.5019 9887 | 47.5379 9825 | 24 |
| 25 | 41.6459 0829 | 44.5652 1015 | 47.7270 9882 | 51.1525 8816 | 25 |
| 26 | 44.3117 4462 | 47.5706 4460 | 51.1134 5376 | 54.9659 8051 | 26 |
| 27 | 47.0842 1440 | 50.7113 2361 | 54.6691 2645 | 58.9891 0943 | 27 |
| 28 | 49.9675 8298 | 53.9933 3317 | 58.4025 8277 | 63.2335 1045 | 28 |
| 29 | 52.9662 8630 | 57.4230 3316 | 62.3227 1191 | 67.7113 5353 | 29 |
| 30 | 56.0849 3775 | 61.0070 6966 | 66.4388 4750 | 72.4354 7797 | 30 |
| 31 | 59.3283 3526 | 64.7523 8779 | 70.7607 8988 | 77.4194 2926 | 31 |
| 32 | 62.7014 6867 | 68.6662 4524 | 75.2988 2937 | 82.6774 9787 | 32 |
| 33 | 66.2095 2742 | 72.7562 2628 | 80.0637 7084 | 88.2247 6025 | 33 |
| 34 | 69.8579 0851 | 77.0302 5646 | 85.0669 5938 | 94.0771 2207 | 34 |
| 35 | 73.6522 2486 | 81.4966 1800 | 90.3203 0735 | 100.2513 6378 | 35 |
| 36 | 77.5983 1385 | 86.1639 6581 | 95.8363 2272 | 106.7651 8879 | 36 |
| 37 | 81.7022 4640 | 91.0413 4427 | 101.6281 3886 | 113.6372 7417 | 37 |
| 38 | 85.9703 3626 | 96.1382 0476 | 107.7095 4580 | 120.8873 2425 | 38 |
| 39 | 90.4091 4971 | 101.4644 2398 | 114.0950 2309 | 128.5361 2708 | 39 |
| 40 | 95.0255 1570 | 107.0303 2306 | 120.7997 7424 | 136.6056 1407 | 40 |
| 41 | 99.8265 3633 | 112.8466 8760 | 127.8397 6295 | 145.1189 2285 | 41 |
| 42 | 104.8195 9778 | 118.9247 8854 | 135.2317 5110 | 154.1004 6360 | 42 |
| 43 | 110.0123 8169 | 125.2764 0402 | 142.9933 3866 | 163.5759 8910 | 43 |
| 44 | 115.4128 7696 | 131.9138 4220 | 151.1430 0559 | 173.5726 6850 | 44 |
| 45 | 121.0293 9204 | 138.8499 6510 | 159.7001 5587 | 184.1191 6527 | 45 |
| 46 | 126.8705 6772 | 146.0982 1353 | 168.6851 6366 | 195.2457 1936 | 46 |
| 47 | 132.9453 9043 | 153.6726 3314 | 178.1194 2185 | 206.9842 3392 | 47 |
| 48 | 139.2632 0604 | 161.5879 0163 | 188.0253 9294 | 219.3683 6679 | 48 |
| 49 | 145.8337 3429 | 169.8593 5720 | 198.4266 6259 | 232.4336 2696 | 49 |
| 50 | 152.6670 8366 | 178.5030 2828 | 209.3479 9572 | 246.2174 7645 | 50 |

## AMOUNT OF ANNUITY OF 1 PER PERIOD

$$s_{\overline{n}|i} = \frac{(1+i)^n - 1}{i}$$

| $n$ | 6% | 6½% | 7% | 8% | $n$ |
|---|---|---|---|---|---|
| 1 | 1.0000 0000 | 1.0000 0000 | 1.0000 0000 | 1.0000 0000 | 1 |
| 2 | 2.0600 0000 | 2.0650 0000 | 2.0700 0000 | 2.0800 0000 | 2 |
| 3 | 3.1836 0000 | 3.1992 2500 | 3.2149 0000 | 3.2464 0000 | 3 |
| 4 | 4.3746 1600 | 4.4071 7463 | 4.4399 4300 | 4.5061 1200 | 4 |
| 5 | 5.6370 9296 | 5.6936 4098 | 5.7507 3901 | 5.8666 0096 | 5 |
| 6 | 6.9753 1854 | 7.0637 2764 | 7.1532 9074 | 7.3359 2904 | 6 |
| 7 | 8.3938 3765 | 8.5228 6994 | 8.6540 2109 | 8.9228 0336 | 7 |
| 8 | 9.8974 6791 | 10.0768 5648 | 10.2598 0257 | 10.6366 2763 | 8 |
| 9 | 11.4913 1598 | 11.7318 5215 | 11.9779 8875 | 12.4875 5784 | 9 |
| 10 | 13.1807 9494 | 13.4944 2254 | 13.8164 4796 | 14.4865 6247 | 10 |
| 11 | 14.9716 4264 | 15.3715 6001 | 15.7835 9932 | 16.6454 8746 | 11 |
| 12 | 16.8699 4120 | 17.3707 1141 | 17.8884 5127 | 18.9771 2646 | 12 |
| 13 | 18.8821 3767 | 19.4998 0765 | 20.1406 4286 | 21.4952 9658 | 13 |
| 14 | 21.0150 6593 | 21.7672 9515 | 22.5504 8786 | 24.2149 2030 | 14 |
| 15 | 23.2759 6988 | 24.1821 6933 | 25.1290 2201 | 27.1521 1393 | 15 |
| 16 | 25.6725 2808 | 26.7540 1034 | 27.8880 5355 | 30.3242 8304 | 16 |
| 17 | 28.2128 7976 | 29.4930 2101 | 30.8402 1730 | 33.7502 2569 | 17 |
| 18 | 30.9056 5255 | 32.4100 6738 | 33.9990 3251 | 37.4502 4374 | 18 |
| 19 | 33.7599 9170 | 35.5167 2176 | 37.3789 6479 | 41.4462 6324 | 19 |
| 20 | 36.7855 9120 | 38.8253 0867 | 40.9954 9232 | 45.7619 6430 | 20 |
| 21 | 39.9927 2668 | 42.3489 5373 | 44.8651 7678 | 50.4229 2144 | 21 |
| 22 | 43.3922 9028 | 46.1016 3573 | 49.0057 3916 | 55.4567 5516 | 22 |
| 23 | 46.9958 2769 | 50.0982 4205 | 53.4361 4090 | 60.8932 9557 | 23 |
| 24 | 50.8155 7735 | 54.3546 2778 | 58.1766 7076 | 66.7647 5922 | 24 |
| 25 | 54.8645 1200 | 58.8876 7859 | 63.2490 3772 | 73.1059 3995 | 25 |
| 26 | 59.1563 8272 | 63.7153 7769 | 68.6764 7036 | 79.9544 1515 | 26 |
| 27 | 63.7057 6568 | 68.8568 7725 | 74.4838 2328 | 87.3507 6836 | 27 |
| 28 | 68.5281 1162 | 74.3325 7427 | 80.6976 9091 | 95.3388 2983 | 28 |
| 29 | 73.6397 9832 | 80.1641 9159 | 87.3465 2927 | 103.9659 3622 | 29 |
| 30 | 79.0581 8622 | 86.3748 6405 | 94.4607 8632 | 113.2832 1111 | 30 |
| 31 | 84.8016 7739 | 92.9892 3021 | 102.0730 4137 | 123.3458 6800 | 31 |
| 32 | 90.8897 7803 | 100.0335 3017 | 110.2181 5426 | 134.2135 3744 | 32 |
| 33 | 97.3431 6471 | 107.5357 0963 | 118.9334 2506 | 145.9506 2044 | 33 |
| 34 | 104.1837 5460 | 115.5255 3076 | 128.2587 6481 | 158.6266 7007 | 34 |
| 35 | 111.4347 7987 | 124.0346 9026 | 138.2368 7835 | 172.3168 0368 | 35 |
| 36 | 119.1208 6666 | 133.0969 4513 | 148.9134 5984 | 187.1021 4797 | 36 |
| 37 | 127.2681 1866 | 142.7482 4656 | 160.3374 0202 | 203.0703 1981 | 37 |
| 38 | 135.9042 0578 | 153.0268 8259 | 172.5610 2017 | 220.3159 4540 | 38 |
| 39 | 145.0584 5813 | 163.9736 2996 | 185.6402 9158 | 238.9412 2103 | 39 |
| 40 | 154.7619 6562 | 175.6319 1590 | 199.6351 1199 | 259.0565 1871 | 40 |
| 41 | 165.0476 8356 | 188.0479 9044 | 214.6095 6983 | 280.7810 4021 | 41 |
| 42 | 175.9505 4457 | 201.2711 0981 | 230.6322 3972 | 304.2435 2342 | 42 |
| 43 | 187.5075 7724 | 215.3537 3195 | 247.7764 9650 | 329.5830 0530 | 43 |
| 44 | 199.7580 3188 | 230.3517 2453 | 266.1208 5125 | 356.9496 4572 | 44 |
| 45 | 212.7435 1379 | 246.3245 8662 | 285.7493 1084 | 386.5056 1738 | 45 |
| 46 | 226.5081 2462 | 263.3356 8475 | 306.7517 6260 | 418.4260 6677 | 46 |
| 47 | 241.0986 1210 | 281.4525 0426 | 329.2243 8598 | 452.9001 5211 | 47 |
| 48 | 256.5645 2882 | 300.7469 1704 | 353.2700 9300 | 490.1321 6428 | 48 |
| 49 | 272.9584 0055 | 321.2954 6665 | 378.9989 9951 | 530.3427 3742 | 49 |
| 50 | 290.3359 0458 | 343.1796 7198 | 406.5289 2947 | 573.7701 5642 | 50 |

## PRESENT VALUE OF ANNUITY OF 1 PER PERIOD

$$a_{\overline{n}|i} = \frac{1 - (1+i)^{-n}}{i}$$

| $n$ | $\frac{1}{4}\%$ | $\frac{7}{24}\%$ | $\frac{1}{3}\%$ | $\frac{3}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 0.9975 0623 | 0.9970 9182 | 0.9966 7774 | 0.9962 6401 | 1 |
| 2 | 1.9925 2492 | 1.9912 8390 | 1.9900 4426 | 1.9888 0599 | 2 |
| 3 | 2.9850 6227 | 2.9825 8470 | 2.9801 1056 | 2.9776 3984 | 3 |
| 4 | 3.9751 2446 | 3.9710 0261 | 3.9668 8760 | 3.9627 7942 | 4 |
| 5 | 4.9627 1766 | 4.9565 4602 | 4.9503 8631 | 4.9442 3852 | 5 |
| 6 | 5.9478 4804 | 5.9392 2328 | 5.9306 1759 | 5.9220 3090 | 6 |
| 7 | 6.9305 2174 | 6.9190 4274 | 6.9075 9228 | 6.8961 7027 | 7 |
| 8 | 7.9107 4487 | 7.8960 1270 | 7.8813 2121 | 7.8666 7025 | 8 |
| 9 | 8.8885 2357 | 8.8701 4146 | 8.8518 1516 | 8.8335 4446 | 9 |
| 10 | 9.8638 6391 | 9.8414 3726 | 9.8190 8487 | 9.7968 0644 | 10 |
| 11 | 10.8367 7198 | 10.8099 0836 | 10.7831 4107 | 10.7564 6968 | 11 |
| 12 | 11.8072 5384 | 11.7755 6297 | 11.7439 9442 | 11.7125 4762 | 12 |
| 13 | 12.7753 1555 | 12.7384 0928 | 12.7016 5557 | 12.6650 5367 | 13 |
| 14 | 13.7409 6314 | 13.6984 5545 | 13.6561 3512 | 13.6140 0117 | 14 |
| 15 | 14.7042 0264 | 14.6557 0963 | 14.6074 4364 | 14.5594 0340 | 15 |
| 16 | 15.6650 4004 | 15.6101 7994 | 15.5555 9167 | 15.5012 7363 | 16 |
| 17 | 16.6234 8133 | 16.5618 7447 | 16.5005 8970 | 16.4396 2503 | 17 |
| 18 | 17.5795 3250 | 17.5108 0130 | 17.4424 4821 | 17.3744 7077 | 18 |
| 19 | 18.5331 9950 | 18.4569 6848 | 18.3811 7762 | 18.3058 2393 | 19 |
| 20 | 19.4844 8828 | 19.4003 8402 | 19.3167 8832 | 19.2336 9756 | 20 |
| 21 | 20.4334 0477 | 20.3410 5594 | 20.2492 9069 | 20.1581 0467 | 21 |
| 22 | 21.3799 5488 | 21.2789 9222 | 21.1786 9504 | 21.0790 5820 | 22 |
| 23 | 22.3241 4452 | 22.2142 0080 | 22.1050 1167 | 21.9965 7106 | 23 |
| 24 | 23.2659 7957 | 23.1466 8962 | 23.0282 5083 | 22.9106 5610 | 24 |
| 25 | 24.2054 6591 | 24.0764 6659 | 23.9484 2275 | 23.8213 2613 | 25 |
| 26 | 25.1426 0939 | 25.0035 3960 | 24.8655 3763 | 24.7285 9390 | 26 |
| 27 | 26.0774 1585 | 25.9279 1651 | 25.7796 0561 | 25.6324 7213 | 27 |
| 28 | 27.0098 9112 | 26.8496 0516 | 26.6906 3682 | 26.5329 7348 | 28 |
| 29 | 27.9400 4102 | 27.7686 1337 | 27.5986 4135 | 27.4301 1056 | 29 |
| 30 | 28.8678 7134 | 28.6849 4894 | 28.5036 2925 | 28.3238 9595 | 30 |
| 31 | 29.7933 8787 | 29.5986 1963 | 29.4056 1055 | 29.2143 4217 | 31 |
| 32 | 30.7165 9638 | 30.5096 3320 | 30.3045 9523 | 30.1014 6169 | 32 |
| 33 | 31.6375 0262 | 31.4179 9738 | 31.2005 9325 | 30.9852 6694 | 33 |
| 34 | 32.5561 1234 | 32.3237 1986 | 32.0936 1454 | 31.8657 7030 | 34 |
| 35 | 33.4724 3126 | 33.2268 0834 | 32.9836 6898 | 32.7429 8411 | 35 |
| 36 | 34.3864 6510 | 34.1272 7046 | 33.8707 6642 | 33.6169 2066 | 36 |
| 37 | 35.2982 1955 | 35.0251 1388 | 34.7549 1670 | 34.4875 9219 | 37 |
| 38 | 36.2077 0030 | 35.9203 4621 | 35.6361 2960 | 35.3550 1090 | 38 |
| 39 | 37.1149 1302 | 36.8129 7503 | 36.5144 1488 | 36.2191 8894 | 39 |
| 40 | 38.0198 6336 | 37.7030 0792 | 37.3897 8228 | 37.0801 3842 | 40 |
| 41 | 38.9225 5697 | 38.5904 5244 | 38.2622 4147 | 37.9378 7140 | 41 |
| 42 | 39.8229 9947 | 39.4753 1610 | 39.1318 0213 | 38.7923 9990 | 42 |
| 43 | 40.7211 9648 | 40.3576 0641 | 39.9984 7389 | 39.6437 3589 | 43 |
| 44 | 41.6171 5359 | 41.2373 3086 | 40.8622 6633 | 40.4918 9130 | 44 |
| 45 | 42.5108 7640 | 42.1144 9691 | 41.7231 8903 | 41.3368 7801 | 45 |
| 46 | 43.4023 7047 | 42.9891 1200 | 42.5812 5153 | 42.1787 0785 | 46 |
| 47 | 44.2916 4137 | 43.8611 8355 | 43.4364 6332 | 43.0173 9263 | 47 |
| 48 | 45.1786 9463 | 44.7307 1895 | 44.2888 3387 | 43.8529 4409 | 48 |
| 49 | 46.0635 3580 | 45.5977 2559 | 45.1383 7263 | 44.6853 7394 | 49 |
| 50 | 46.9461 7037 | 46.4622 1081 | 45.9850 8900 | 45.5146 9383 | 50 |

## PRESENT VALUE OF ANNUITY OF 1 PER PERIOD

$$a_{\overline{n}|i} = \frac{1 - (1 + i)^{-n}}{i}$$

| $n$ | $\frac{5}{12}\%$ | $\frac{1}{2}\%$ | $\frac{7}{12}\%$ | $\frac{5}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 0.9958 5062 | 0.9950 2488 | 0.9942 0050 | 0.9937 8882 | 1 |
| 2 | 1.9875 6908 | 1.9850 9938 | 1.9826 3513 | 1.9814 0504 | 2 |
| 3 | 2.9751 7253 | 2.9702 4814 | 2.9653 3732 | 2.9628 8699 | 3 |
| 4 | 3.9586 7804 | 3.9504 9566 | 3.9423 4034 | 3.9382 7279 | 4 |
| 5 | 4.9381 0261 | 4.9258 6633 | 4.9136 7722 | 4.9076 0029 | 5 |
| 6 | 5.9134 6318 | 5.8963 8441 | 5.8793 8083 | 5.8709 0712 | 6 |
| 7 | 6.8847 7661 | 6.8620 7404 | 6.8394 8384 | 6.8282 3068 | 7 |
| 8 | 7.8520 5970 | 7.8229 5924 | 7.7940 1874 | 7.7796 0813 | 8 |
| 9 | 8.8153 2916 | 8.7790 6392 | 8.7430 1780 | 8.7250 7640 | 9 |
| 10 | 9.7746 0165 | 9.7304 1186 | 9.6865 1314 | 9.6646 7220 | 10 |
| 11 | 10.7298 9376 | 10.6770 2673 | 10.6245 3667 | 10.5984 3200 | 11 |
| 12 | 11.6812 2200 | 11.6189 3207 | 11.5571 2014 | 11.5263 9205 | 12 |
| 13 | 12.6286 0283 | 12.5561 5131 | 12.4842 9509 | 12.4485 8837 | 13 |
| 14 | 13.5720 5261 | 13.4887 0777 | 13.4060 9288 | 13.3650 5676 | 14 |
| 15 | 14.5115 8766 | 14.4166 2465 | 14.3225 4470 | 14.2758 3281 | 15 |
| 16 | 15.4472 2422 | 15.3399 2502 | 15.2336 8156 | 15.1809 5186 | 16 |
| 17 | 16.3789 7848 | 16.2586 3186 | 16.1395 3427 | 16.0804 4905 | 17 |
| 18 | 17.3068 6654 | 17.1727 6802 | 17.0401 3350 | 16.9743 5931 | 18 |
| 19 | 18.2309 0443 | 18.0823 5624 | 17.9355 0969 | 17.8627 1733 | 19 |
| 20 | 19.1511 0815 | 18.9874 1915 | 18.8256 9315 | 18.7455 5759 | 20 |
| 21 | 20.0674 9359 | 19.8879 7925 | 19.7107 1398 | 19.6229 1438 | 21 |
| 22 | 20.9800 7661 | 20.7840 5896 | 20.5906 0213 | 20.4948 2174 | 22 |
| 23 | 21.8888 7297 | 21.6756 8055 | 21.4653 8738 | 21.3613 1353 | 23 |
| 24 | 22.7938 9839 | 22.5628 6622 | 22.3350 9930 | 22.2224 2338 | 24 |
| 25 | 23.6951 6853 | 23.4456 3803 | 23.1997 6732 | 23.0781 8473 | 25 |
| 26 | 24.5926 9895 | 24.3240 1794 | 24.0594 2070 | 23.9286 3079 | 26 |
| 27 | 25.4865 0517 | 25.1980 2780 | 24.9140 8852 | 24.7737 9457 | 27 |
| 28 | 26.3766 0266 | 26.0676 8936 | 25.7637 9968 | 25.6137 0889 | 28 |
| 29 | 27.2630 0680 | 26.9330 2423 | 26.6085 8295 | 26.4484 0635 | 29 |
| 30 | 28.1457 3291 | 27.7940 5397 | 27.4484 6689 | 27.2779 1935 | 30 |
| 31 | 29.0247 9626 | 28.6507 9997 | 28.2834 7993 | 28.1022 8010 | 31 |
| 32 | 29.9002 1205 | 29.5032 8355 | 29.1136 5030 | 28.9215 2060 | 32 |
| 33 | 30.7719 9540 | 30.3515 2592 | 29.9390 0610 | 29.7356 7265 | 33 |
| 34 | 31.6401 6139 | 31.1955 4818 | 30.7595 7524 | 30.5447 6785 | 34 |
| 35 | 32.5047 2504 | 32.0353 7132 | 31.5753 8549 | 31.3488 3761 | 35 |
| 36 | 33.3657 0128 | 32.8710 1624 | 32.3864 6445 | 32.1479 1315 | 36 |
| 37 | 34.2231 0501 | 33.7025 0372 | 33.1928 3955 | 32.9420 2550 | 37 |
| 38 | 35.0769 5105 | 34.5298 5445 | 33.9945 3808 | 33.7312 0546 | 38 |
| 39 | 35.9272 5416 | 35.3530 8900 | 34.7915 8716 | 34.5154 8369 | 39 |
| 40 | 36.7740 2904 | 36.1722 2786 | 35.5840 1374 | 35.2948 9062 | 40 |
| 41 | 37.6172 9033 | 36.9872 9141 | 36.3718 4465 | 36.0694 5652 | 41 |
| 42 | 38.4570 5261 | 37.7982 9991 | 37.1551 0653 | 36.8392 1145 | 42 |
| 43 | 39.2933 3040 | 38.6052 7354 | 37.9338 2588 | 37.6041 8529 | 43 |
| 44 | 40.1261 3816 | 39.4082 3238 | 38.7080 2904 | 38.3644 0774 | 44 |
| 45 | 40.9554 9028 | 40.2071 9640 | 39.4777 4221 | 39.1199 0831 | 45 |
| 46 | 41.7814 0111 | 41.0021 8547 | 40.2429 9143 | 39.8707 1634 | 46 |
| 47 | 42.6038 8492 | 41.7932 1937 | 41.0038 0258 | 40.6168 6096 | 47 |
| 48 | 43.4229 5594 | 42.5803 1778 | 41.7602 0141 | 41.3583 7114 | 48 |
| 49 | 44.2386 2832 | 43.3635 0028 | 42.5122 1349 | 42.0952 7566 | 49 |
| 50 | 45.0509 1617 | 44.1427 8635 | 43.2598 6428 | 42.8276 0314 | 50 |

## PRESENT VALUE OF ANNUITY OF 1 PER PERIOD

$$a_{\overline{n}|i} = \frac{1 - (1 + i)^{-n}}{i}$$

| $n$ | $\frac{3}{4}\%$ | $\frac{7}{8}\%$ | $1\%$ | $1\frac{1}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 0.9925 5583 | 0.9913 2590 | 0.9900 9901 | 0.9888 7515 | 1 |
| 2 | 1.9777 2291 | 1.9740 5294 | 1.9703 9506 | 1.9667 4923 | 2 |
| 3 | 2.9555 5624 | 2.9482 5570 | 2.9409 8521 | 2.9337 4460 | 3 |
| 4 | 3.9261 1041 | 3.9140 0813 | 3.9019 6555 | 3.8899 8230 | 4 |
| 5 | 4.8894 3961 | 4.8713 8352 | 4.8534 3124 | 4.8355 8200 | 5 |
| 6 | 5.8455 9763 | 5.8204 5454 | 5.7954 7647 | 5.7706 6205 | 6 |
| 7 | 6.7946 3785 | 6.7612 9323 | 6.7281 9453 | 6.6953 3948 | 7 |
| 8 | 7.7366 1325 | 7.6939 7098 | 7.6516 7775 | 7.6097 3002 | 8 |
| 9 | 8.6715 7642 | 8.6185 5859 | 8.5660 1758 | 8.5139 4810 | 9 |
| 10 | 9.5995 7958 | 9.5351 2624 | 9.4713 0453 | 9.4081 0690 | 10 |
| 11 | 10.5206 7452 | 10.4437 4348 | 10.3676 2825 | 10.2923 1832 | 11 |
| 12 | 11.4349 1267 | 11.3444 7929 | 11.2550 7747 | 11.1666 9302 | 12 |
| 13 | 12.3423 4508 | 12.2374 0202 | 12.1337 4007 | 12.0313 4044 | 13 |
| 14 | 13.2430 2242 | 13.1225 7945 | 13.0037 0304 | 12.8863 6880 | 14 |
| 15 | 14.1369 9495 | 14.0000 7876 | 13.8650 5252 | 13.7318 8509 | 15 |
| 16 | 15.0243 1261 | 14.8699 6656 | 14.7178 7378 | 14.5679 9514 | 16 |
| 17 | 15.9050 2492 | 15.7323 0885 | 15.5622 5127 | 15.3948 0360 | 17 |
| 18 | 16.7791 8107 | 16.5871 7111 | 16.3982 6858 | 16.2124 1395 | 18 |
| 19 | 17.6468 2984 | 17.4346 1820 | 17.2260 0850 | 17.0209 2850 | 19 |
| 20 | 18.5080 1969 | 18.2747 1445 | 18.0455 5297 | 17.8204 4845 | 20 |
| 21 | 19.3627 9870 | 19.1075 2361 | 18.8569 8313 | 18.6110 7387 | 21 |
| 22 | 20.2112 1459 | 19.9331 0891 | 19.6603 7934 | 19.3929 0371 | 22 |
| 23 | 21.0533 1473 | 20.7515 3300 | 20.4558 2113 | 20.1660 3580 | 23 |
| 24 | 21.8891 4614 | 21.5628 5799 | 21.2433 8726 | 20.9305 6693 | 24 |
| 25 | 22.7187 5547 | 22.3671 4547 | 22.0231 5570 | 21.6865 9276 | 25 |
| 26 | 23.5421 8905 | 23.1644 5647 | 22.7952 0366 | 22.4342 0792 | 26 |
| 27 | 24.3594 9286 | 23.9548 5152 | 23.5596 0759 | 23.1735 0598 | 27 |
| 28 | 25.1707 1251 | 24.7383 9060 | 24.3164 4316 | 23.9045 7946 | 28 |
| 29 | 25.9758 9331 | 25.5151 3319 | 25.0657 8530 | 24.6275 1986 | 29 |
| 30 | 26.7750 8021 | 26.2851 3823 | 25.8077 0822 | 25.3424 1766 | 30 |
| 31 | 27.5683 1783 | 27.0484 6417 | 26.5422 8537 | 26.0493 6233 | 31 |
| 32 | 28.3556 5045 | 27.8051 6894 | 27.2695 8947 | 26.7484 4236 | 32 |
| 33 | 29.1371 2203 | 28.5553 0998 | 27.9896 9255 | 27.4397 4522 | 33 |
| 34 | 29.9127 7621 | 29.2989 4422 | 28.7026 6589 | 28.1233 5745 | 34 |
| 35 | 30.6826 5629 | 30.0361 2809 | 29.4085 8009 | 28.7993 6460 | 35 |
| 36 | 31.4468 0525 | 30.7669 1757 | 30.1075 0504 | 29.4678 5127 | 36 |
| 37 | 32.2052 6576 | 31.4913 6810 | 30.7995 0994 | 30.1289 0114 | 37 |
| 38 | 32.9580 8016 | 32.2095 3467 | 31.4846 6330 | 30.7825 9692 | 38 |
| 39 | 33.7052 9048 | 32.9214 7179 | 32.1630 3298 | 31.4290 2044 | 39 |
| 40 | 34.4469 3844 | 33.6272 3350 | 32.8346 8611 | 32.0682 5260 | 40 |
| 41 | 35.1830 6545 | 34.3268 7335 | 33.4996 8922 | 32.7903 7340 | 41 |
| 42 | 35.9137 1260 | 35.0204 4446 | 34.1581 0814 | 33.3254 6195 | 42 |
| 43 | 36.6389 2070 | 35.7079 9947 | 34.8100 0806 | 33.9435 9649 | 43 |
| 44 | 37.3587 3022 | 36.3895 9055 | 35.4554 5352 | 34.5548 5438 | 44 |
| 45 | 38.0731 8136 | 37.0652 6944 | 36.0945 0844 | 35.1593 1212 | 45 |
| 46 | 38.7823 1401 | 37.7350 8743 | 36.7272 3608 | 35.7570 4536 | 46 |
| 47 | 39.4861 6775 | 38.3990 9535 | 37.3536 9909 | 36.3481 2891 | 47 |
| 48 | 40.1847 8189 | 39.0573 4359 | 37.9739 5949 | 36.9326 3674 | 48 |
| 49 | 40.8781 9542 | 39.7098 8212 | 38.5880 7871 | 37.5106 4202 | 49 |
| 50 | 41.5664 4707 | 40.3567 6047 | 39.1961 1753 | 38.0822 1708 | 50 |

## PRESENT VALUE OF ANNUITY OF 1 PER PERIOD

$$a_{\overline{n}|i} = \frac{1 - (1+i)^{-n}}{i}$$

| $n$ | $1\frac{1}{4}\%$ | $1\frac{3}{8}\%$ | $1\frac{1}{2}\%$ | $1\frac{5}{8}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 0.9876 5432 | 0.9864 3650 | 0.9852 2167 | 0.9840 0984 | 1 |
| 2 | 1.9631 1538 | 1.9594 9346 | 1.9558 8342 | 1.9522 8521 | 2 |
| 3 | 2.9265 3371 | 2.9193 5237 | 2.9122 0042 | 2.9050 7769 | 3 |
| 4 | 3.8780 5798 | 3.8661 9222 | 3.8543 8465 | 3.8426 3488 | 4 |
| 5 | 4.8178 3504 | 4.8001 8962 | 4.7826 4497 | 4.7652 0037 | 5 |
| 6 | 5.7460 0992 | 5.7215 1874 | 5.6971 8717 | 5.6730 1389 | 6 |
| 7 | 6.6627 2585 | 6.6303 5140 | 6.5982 1396 | 6.5663 1134 | 7 |
| 8 | 7.5681 2429 | 7.5268 5712 | 7.4859 2508 | 7.4453 2481 | 8 |
| 9 | 8.4623 4498 | 8.4112 0308 | 8.3605 1732 | 8.3102 8271 | 9 |
| 10 | 9.3455 2591 | 9.2835 5421 | 9.2221 8455 | 9.1614 0980 | 10 |
| 11 | 10.2178 0337 | 10.1440 7320 | 10.0711 1779 | 9.9989 2724 | 11 |
| 12 | 11.0793 1197 | 10.9929 2054 | 10.9075 0521 | 10.8230 5263 | 12 |
| 13 | 11.9301 8466 | 11.8302 5454 | 11.7315 3222 | 11.6340 0013 | 13 |
| 14 | 12.7705 5275 | 12.6562 3136 | 12.5433 8150 | 12.4319 8045 | 14 |
| 15 | 13.6005 4592 | 13.4710 0504 | 13.3432 3301 | 13.2172 0093 | 15 |
| 16 | 14.4202 9227 | 14.2747 2754 | 14.1312 6405 | 13.9898 6562 | 16 |
| 17 | 15.2299 1829 | 15.0675 4874 | 14.9076 4931 | 14.7501 7527 | 17 |
| 18 | 16.0295 4893 | 15.8496 1651 | 15.6725 6089 | 15.4983 2745 | 18 |
| 19 | 16.8193 0759 | 16.6210 7671 | 16.4261 6837 | 16.2345 1655 | 19 |
| 20 | 17.5993 1613 | 17.3820 7320 | 17.1686 3879 | 16.9589 3388 | 20 |
| 21 | 18.3696 9495 | 18.1327 4792 | 17.9001 3673 | 17.6717 6765 | 21 |
| 22 | 19.1305 6291 | 18.8732 4086 | 18.6208 2437 | 18.3732 0310 | 22 |
| 23 | 19.8820 3744 | 19.6036 9012 | 19.3308 6145 | 19.0634 2249 | 23 |
| 24 | 20.6242 3451 | 20.3242 3193 | 20.0304 0537 | 19.7426 0515 | 24 |
| 25 | 21.3572 6865 | 21.0350 0067 | 20.7196 1120 | 20.4109 2758 | 25 |
| 26 | 22.0812 5299 | 21.7361 2890 | 21.3986 3172 | 21.0685 6342 | 26 |
| 27 | 22.7962 9925 | 22.4277 4737 | 22.0676 1746 | 21.7156 8357 | 27 |
| 28 | 23.5025 1778 | 23.1099 8508 | 22.7267 1671 | 22.3524 5615 | 28 |
| 29 | 24.2000 1756 | 23.7829 6925 | 23.3760 7558 | 22.9790 4665 | 29 |
| 30 | 24.8889 0623 | 24.4468 2540 | 24.0158 3801 | 23.5956 1786 | 30 |
| 31 | 25.5692 9010 | 25.1016 7734 | 24.6461 4582 | 24.2023 2999 | 31 |
| 32 | 26.2412 7418 | 25.7476 4719 | 25.2671 3874 | 24.7993 4071 | 32 |
| 33 | 26.9049 6215 | 26.3848 5543 | 25.8789 5442 | 25.3868 0512 | 33 |
| 34 | 27.5604 5644 | 27.0134 2089 | 26.4817 2849 | 25.9648 7589 | 34 |
| 35 | 28.2078 5822 | 27.6334 6080 | 27.0755 9458 | 26.5337 0321 | 35 |
| 36 | 28.8472 6737 | 28.2450 9080 | 27.6606 8431 | 27.0934 3490 | 36 |
| 37 | 29.4787 8259 | 28.8484 2496 | 28.2371 2740 | 27.6442 1638 | 37 |
| 38 | 30.1025 0133 | 29.4435 7579 | 28.8050 5163 | 28.1861 9078 | 38 |
| 39 | 30.7185 1983 | 30.0306 5430 | 29.3645 8288 | 28.7194 9892 | 39 |
| 40 | 31.3269 3316 | 30.6097 6996 | 29.9158 4520 | 29.2442 7938 | 40 |
| 41 | 31.9278 3522 | 31.1810 3079 | 30.4589 6079 | 29.7606 6852 | 41 |
| 42 | 32.5213 1874 | 31.7445 4332 | 30.9940 5004 | 30.2688 0051 | 42 |
| 43 | 33.1074 7530 | 32.3004 1264 | 31.5212 3157 | 30.7688 0739 | 43 |
| 44 | 33.6863 9536 | 32.8487 4243 | 32.0406 2223 | 31.2608 1908 | 44 |
| 45 | 34.2581 6825 | 33.3896 3495 | 32.5523 3718 | 31.7449 6342 | 45 |
| 46 | 34.8228 8222 | 33.9231 9108 | 33.0564 8983 | 32.2213 6622 | 46 |
| 47 | 35.3806 2442 | 34.4495 1031 | 33.5531 9195 | 32.6901 5127 | 47 |
| 48 | 35.9314 8091 | 34.9686 9081 | 34.0425 5365 | 33.1514 4036 | 48 |
| 49 | 36.4755 3670 | 35.4808 2941 | 34.5246 8339 | 33.6053 5337 | 49 |
| 50 | 37.0128 7575 | 35.9860 2161 | 34.9996 8807 | 34.0520 0823 | 50 |

## PRESENT VALUE OF ANNUITY OF 1 PER PERIOD

$$a_{\overline{n}|i} = \frac{1 - (1+i)^{-n}}{i}$$

| $n$ | $1\frac{3}{4}\%$ | $2\%$ | $2\frac{1}{4}\%$ | $2\frac{1}{2}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 0.9828 0098 | 0.9803 9216 | 0.9779 9511 | 0.9756 0976 | 1 |
| 2 | 1.9486 9875 | 1.9415 6094 | 1.9344 6955 | 1.9274 2415 | 2 |
| 3 | 2.8979 8403 | 2.8838 8327 | 2.8698 9687 | 2.8560 2356 | 3 |
| 4 | 3.8309 4254 | 3.8077 2870 | 3.7847 4021 | 3.7619 7421 | 4 |
| 5 | 4.7478 5508 | 4.7134 5951 | 4.6794 5253 | 4.6458 2850 | 5 |
| 6 | 5.6489 9762 | 5.6014 3089 | 5.5544 7680 | 5.5081 2536 | 6 |
| 7 | 6.5346 4139 | 6.4719 9107 | 6.4102 4626 | 6.3493 9060 | 7 |
| 8 | 7.4050 5297 | 7.3254 8144 | 7.2471 8461 | 7.1701 3717 | 8 |
| 9 | 8.2604 9432 | 8.1622 3671 | 8.0657 0622 | 7.9708 6553 | 9 |
| 10 | 9.1012 2291 | 8.9825 8501 | 8.8662 1635 | 8.7520 6393 | 10 |
| 11 | 9.9274 9181 | 9.7868 4805 | 9.6491 1134 | 9.5142 0871 | 11 |
| 12 | 10.7395 4969 | 10.5753 4122 | 10.4147 7882 | 10.2577 6460 | 12 |
| 13 | 11.5376 4097 | 11.3483 7375 | 11.1635 9787 | 10.9831 8497 | 13 |
| 14 | 12.3220 0587 | 12.1062 4877 | 11.8959 3924 | 11.6909 1217 | 14 |
| 15 | 13.0928 8046 | 12.8492 6350 | 12.6121 6551 | 12.3813 7773 | 15 |
| 16 | 13.8504 9677 | 13.5777 0931 | 13.3126 3131 | 13.0550 0266 | 16 |
| 17 | 14.5950 8282 | 14.2918 7188 | 13.9976 8343 | 13.7121 9772 | 17 |
| 18 | 15.3268 6272 | 14.9920 3125 | 14.6676 6106 | 14.3533 6363 | 18 |
| 19 | 16.0460 5673 | 15.6784 6201 | 15.3228 9590 | 14.9788 9134 | 19 |
| 20 | 16.7528 8130 | 16.3514 3334 | 15.9637 1237 | 15.5891 6229 | 20 |
| 21 | 17.4475 4919 | 17.0112 0916 | 16.5904 2775 | 16.1845 4857 | 21 |
| 22 | 18.1302 6948 | 17.6580 4820 | 17.2033 5232 | 16.7654 1324 | 22 |
| 23 | 18.8012 4764 | 18.2922 0412 | 17.8027 8955 | 17.3321 1048 | 23 |
| 24 | 19.4606 8565 | 18.9139 2560 | 18.3890 3624 | 17.8849 8583 | 24 |
| 25 | 20.1087 8196 | 19.5234 5647 | 18.9623 8263 | 18.4243 7642 | 25 |
| 26 | 20.7457 3166 | 20.1210 3576 | 19.5231 1260 | 18.9506 1114 | 26 |
| 27 | 21.3717 2644 | 20.7068 9780 | 20.0715 0376 | 19.4640 1087 | 27 |
| 28 | 21.9869 5474 | 21.2812 7236 | 20.6078 2764 | 19.9648 8866 | 28 |
| 29 | 22.5916 0171 | 21.8443 8466 | 21.1323 4977 | 20.4535 4991 | 29 |
| 30 | 23.1858 4934 | 22.3964 5555 | 21.6453 2985 | 20.9302 9259 | 30 |
| 31 | 23.7698 7650 | 22.9377 0152 | 22.1470 2186 | 21.3954 0741 | 31 |
| 32 | 24.3438 5897 | 23.4683 3482 | 22.6376 7419 | 21.8491 7796 | 32 |
| 33 | 24.9079 6951 | 23.9885 6355 | 23.1175 2977 | 22.2918 8094 | 33 |
| 34 | 25.4623 7789 | 24.4985 9172 | 23.5868 2618 | 22.7237 8628 | 34 |
| 35 | 26.0072 5100 | 24.9986 1933 | 24.0457 9577 | 23.1451 5734 | 35 |
| 36 | 26.5427 5283 | 25.4888 4248 | 24.4946 6579 | 23.5562 5107 | 36 |
| 37 | 27.0690 4455 | 25.9694 5341 | 24.9336 5848 | 23.9573 1812 | 37 |
| 38 | 27.5862 8457 | 26.4406 4060 | 25.3629 9118 | 24.3486 0304 | 38 |
| 39 | 28.0946 2857 | 26.9025 8883 | 25.7828 7646 | 24.7303 4443 | 39 |
| 40 | 28.5942 2955 | 27.3554 7924 | 26.1935 2221 | 25.1027 7505 | 40 |
| 41 | 29.0852 3789 | 27.7994 8945 | 26.5951 3174 | 25.4661 2200 | 41 |
| 42 | 29.5678 0135 | 28.2347 9358 | 26.9879 0390 | 25.8206 0683 | 42 |
| 43 | 30.0420 6522 | 28.6615 6233 | 27.3720 3316 | 26.1664 4569 | 43 |
| 44 | 30.5081 7221 | 29.0799 6307 | 27.7477 0969 | 26.5038 4945 | 44 |
| 45 | 30.9662 6261 | 29.4901 5987 | 28.1151 1950 | 26.8330 2386 | 45 |
| 46 | 31.4164 7431 | 29.8923 1360 | 28.4744 4450 | 27.1541 6962 | 46 |
| 47 | 31.8589 4281 | 30.2865 8196 | 28.8258 6259 | 27.4674 8255 | 47 |
| 48 | 32.2938 0129 | 30.6731 1957 | 29.1695 4777 | 27.7731 5371 | 48 |
| 49 | 32.7211 8063 | 31.0520 7801 | 29.5056 7019 | 28.0713 6947 | 49 |
| 50 | 33.1412 0946 | 31.4236 0589 | 29.8343 9627 | 28.3623 1168 | 50 |

## PRESENT VALUE OF ANNUITY OF 1 PER PERIOD

$$a_{\overline{n}|i} = \frac{1 - (1+i)^{-n}}{i}$$

| $n$ | $2\frac{1}{4}\%$ | 3% | $3\frac{1}{4}\%$ | $3\frac{1}{2}\%$ | $n$ |
|---|---|---|---|---|---|
| 1 | 0.9732 3601 | 0.9708 7379 | 0.9685 2300 | 0.9661 8357 | 1 |
| 2 | 1.9204 2434 | 1.9134 6970 | 1.9065 5981 | 1.8996 9428 | 2 |
| 3 | 2.8422 6213 | 2.8286 1135 | 2.8150 7003 | 2.8016 3698 | 3 |
| 4 | 3.7394 2787 | 3.7170 9840 | 3.6949 8308 | 3.6730 7921 | 4 |
| 5 | 4.6125 8186 | 4.5797 0719 | 4.5471 9911 | 4.5150 5238 | 5 |
| 6 | 5.4623 6678 | 5.4171 9144 | 5.3725 8994 | 5.3285 5302 | 6 |
| 7 | 6.2894 0806 | 6.2302 8296 | 6.1719 9994 | 6.1145 4398 | 7 |
| 8 | 7.0943 1441 | 7.0196 9219 | 6.9462 4692 | 6.8739 5554 | 8 |
| 9 | 7.8776 7826 | 7.7861 0892 | 7.6961 2292 | 7.6076 8651 | 9 |
| 10 | 8.6400 7616 | 8.5302 0284 | 8.4223 9508 | 8.3166 0532 | 10 |
| 11 | 9.3820 6926 | 9.2526 2411 | 9.1258 0637 | 9.0015 5104 | 11 |
| 12 | 10.1042 0366 | 9.9540 0399 | 9.8070 7639 | 9.6633 3433 | 12 |
| 13 | 10.8070 1086 | 10.6349 5533 | 10.4669 0207 | 10.3027 3849 | 13 |
| 14 | 11.4910 0814 | 11.2960 7314 | 11.1059 5842 | 10.9205 2028 | 14 |
| 15 | 12.1566 9892 | 11.9379 3509 | 11.7248 9920 | 11.5174 1090 | 15 |
| 16 | 12.8045 7315 | 12.5611 0203 | 12.3243 5758 | 12.0941 1681 | 16 |
| 17 | 13.4351 0769 | 13.1661 1847 | 12.9049 4681 | 12.6513 2059 | 17 |
| 18 | 14.0487 6661 | 13.7535 1308 | 13.4672 6083 | 13.1896 8173 | 18 |
| 19 | 14.6460 0157 | 14.3237 9911 | 14.0118 7490 | 13.7098 3742 | 19 |
| 20 | 15.2272 5213 | 14.8774 7486 | 14.5393 4615 | 14.2124 0330 | 20 |
| 21 | 15.7929 4612 | 15.4150 2414 | 15.0502 1419 | 14.6979 7420 | 21 |
| 22 | 16.3434 9987 | 15.9369 1664 | 15.5450 0163 | 15.1671 2484 | 22 |
| 23 | 16.8793 1861 | 16.4436 0839 | 16.0242 1466 | 15.6204 1047 | 23 |
| 24 | 17.4007 9670 | 16.9355 4212 | 16.4883 4349 | 16.0583 6760 | 24 |
| 25 | 17.9083 1795 | 17.4131 4769 | 16.9378 6295 | 16.4815 1459 | 25 |
| 26 | 18.4022 5592 | 17.8768 4242 | 17.3732 3288 | 16.8903 5226 | 26 |
| 27 | 18.8829 7413 | 18.3270 3147 | 17.7948 9867 | 17.2853 6451 | 27 |
| 28 | 19.3508 2640 | 18.7641 0823 | 18.2032 9169 | 17.6670 1885 | 28 |
| 29 | 19.8061 5708 | 19.1884 5459 | 18.5988 2973 | 18.0357 6700 | 29 |
| 30 | 20.2493 0130 | 19.6004 4135 | 18.9819 1741 | 18.3920 4541 | 30 |
| 31 | 20.6805 8520 | 20.0004 2849 | 19.3529 4664 | 18.7362 7576 | 31 |
| 32 | 21.1003 2623 | 20.3887 6553 | 19.7122 9699 | 19.0688 6547 | 32 |
| 33 | 21.5088 3332 | 20.7657 9178 | 20.0603 3607 | 19.3902 0818 | 33 |
| 34 | 21.9064 0712 | 21.1318 3668 | 20.3974 1992 | 19.7006 8423 | 34 |
| 35 | 22.2933 4026 | 21.4872 2007 | 20.7238 9339 | 20.0006 6110 | 35 |
| 36 | 22.6699 1753 | 21.8322 5250 | 21.0400 9045 | 20.2904 9381 | 36 |
| 37 | 23.0364 1609 | 22.1672 3544 | 21.3463 3457 | 20.5705 2542 | 37 |
| 38 | 23.3931 0568 | 22.4924 6159 | 21.6429 3905 | 20.8410 8736 | 38 |
| 39 | 23.7402 4884 | 22.8082 1513 | 21.9302 0732 | 21.1024 9987 | 39 |
| 40 | 24.0781 0106 | 23.1147 7197 | 22.2084 3324 | 21.3550 7234 | 40 |
| 41 | 24.4069 1101 | 23.4123 9997 | 22.4779 0144 | 21.5991 0371 | 41 |
| 42 | 24.7269 2069 | 23.7013 5920 | 22.7388 8759 | 21.8348 8281 | 42 |
| 43 | 25.0383 6563 | 23.9819 0213 | 22.9916 5869 | 22.0626 8870 | 43 |
| 44 | 25.3414 7507 | 24.2542 7392 | 23.2364 7330 | 22.2827 9102 | 44 |
| 45 | 25.6364 7209 | 24.5187 1254 | 23.4735 8189 | 22.4954 5026 | 45 |
| 46 | 25.9235 7381 | 24.7754 4907 | 23.7032 2701 | 22.7009 1813 | 46 |
| 47 | 26.2029 9154 | 25.0247 0783 | 23.9256 4360 | 22.8994 3780 | 47 |
| 48 | 26.4749 3094 | 25.2667 0664 | 24.1410 5917 | 23.0912 4425 | 48 |
| 49 | 26.7395 9215 | 25.5016 5693 | 24.3496 9412 | 23.2765 6450 | 49 |
| 50 | 26.9971 6998 | 25.7297 6401 | 24.5517 6185 | 23.4556 1787 | 50 |

## PRESENT VALUE OF ANNUITY OF 1 PER PERIOD

$$a_{\overline{n}|i} = \frac{1 - (1 + i)^{-n}}{i}$$

| $n$ | 4% | 4½% | 5% | 5½% | $n$ |
|---|---|---|---|---|---|
| 1 | 0.9615 3846 | 0.9569 3780 | 0.9523 8095 | 0.9478 6730 | 1 |
| 2 | 1.8860 9467 | 1.8726 6775 | 1.8594 1043 | 1.8463 1971 | 2 |
| 3 | 2.7750 9103 | 2.7489 6435 | 2.7232 4803 | 2.6979 3338 | 3 |
| 4 | 3.6298 9522 | 3.5875 2570 | 3.5459 5050 | 3.5051 5012 | 4 |
| 5 | 4.4518 2233 | 4.3899 7674 | 4.3294 7667 | 4.2702 8448 | 5 |
| 6 | 5.2421 3686 | 5.1578 7248 | 5.0756 9207 | 4.9955 3031 | 6 |
| 7 | 6.0020 5467 | 5.8927 0094 | 5.7863 7340 | 5.6829 6712 | 7 |
| 8 | 6.7327 4487 | 6.5958 8607 | 6.4632 1276 | 6.3345 6599 | 8 |
| 9 | 7.4353 3161 | 7.2687 9050 | 7.1078 2168 | 6.9521 9525 | 9 |
| 10 | 8.1108 9578 | 7.9127 1818 | 7.7217 3493 | 7.5376 2583 | 10 |
| 11 | 8.7604 7671 | 8.5289 1692 | 8.3064 1422 | 8.0925 3633 | 11 |
| 12 | 9.3850 7376 | 9.1185 8078 | 8.8632 5164 | 8.6185 1785 | 12 |
| 13 | 9.9856 4785 | 9.6828 5242 | 9.3935 7299 | 9.1170 7853 | 13 |
| 14 | 10.5631 2293 | 10.2228 2528 | 9.8986 4094 | 9.5896 4790 | 14 |
| 15 | 11.1183 8743 | 10.7395 4573 | 10.3796 5804 | 10.0375 8094 | 15 |
| 16 | 11.6522 9561 | 11.2340 1505 | 10.8377 6956 | 10.4621 6203 | 16 |
| 17 | 12.1656 6885 | 11.7071 9143 | 11.2740 6625 | 10.8646 0856 | 17 |
| 18 | 12.6592 9697 | 12.1599 9180 | 11.6895 8690 | 11.2460 7447 | 18 |
| 19 | 13.1339 3940 | 12.5932 9359 | 12.0853 2086 | 11.6076 5352 | 19 |
| 20 | 13.5903 2634 | 13.0079 3645 | 12.4622 1034 | 11.9503 8248 | 20 |
| 21 | 14.0291 5995 | 13.4047 2388 | 12.8211 5271 | 12.2752 4406 | 21 |
| 22 | 14.4511 1533 | 13.7844 2476 | 13.1630 0258 | 12.5831 6973 | 22 |
| 23 | 14.8568 4167 | 14.1477 7489 | 13.4885 7388 | 12.8750 4239 | 23 |
| 24 | 15.2469 6314 | 14.4954 7837 | 13.7986 4179 | 13.1516 9895 | 24 |
| 25 | 15.6220 7994 | 14.8282 0896 | 14.0939 4457 | 13.4139 3266 | 25 |
| 26 | 15.9827 6918 | 15.1466 1145 | 14.3751 8530 | 13.6624 9541 | 26 |
| 27 | 16.3295 8575 | 15.4513 0282 | 14.6430 3362 | 13.8980 9991 | 27 |
| 28 | 16.6630 6322 | 15.7428 7351 | 14.8981 2726 | 14.1214 2172 | 28 |
| 29 | 16.9837 1463 | 16.0218 8853 | 15.1410 7358 | 14.3331 0116 | 29 |
| 30 | 17.2920 3330 | 16.2888 8854 | 15.3724 5103 | 14.5337 4517 | 30 |
| 31 | 17.5884 9356 | 16.5443 9095 | 15.5928 1050 | 14.7239 2907 | 31 |
| 32 | 17.8735 5150 | 16.7888 9086 | 15.8026 7667 | 14.9041 9817 | 32 |
| 33 | 18.1476 4567 | 17.0228 6207 | 16.0025 4921 | 15.0750 6936 | 33 |
| 34 | 18.4111 9776 | 17.2467 5796 | 16.1929 0401 | 15.2370 3257 | 34 |
| 35 | 18.6646 1323 | 17.4610 1240 | 16.3741 9429 | 15.3905 5220 | 35 |
| 36 | 18.9082 8195 | 17.6660 4058 | 16.5468 5171 | 15.5360 6843 | 36 |
| 37 | 19.1425 7880 | 17.8622 3979 | 16.7112 8734 | 15.6739 9851 | 37 |
| 38 | 19.3678 6423 | 18.0499 9023 | 16.8678 9271 | 15.8047 3793 | 38 |
| 39 | 19.5844 8484 | 18.2296 5572 | 17.0170 4067 | 15.9286 6154 | 39 |
| 40 | 19.7927 7388 | 18.4015 8442 | 17.1590 8635 | 16.0461 2469 | 40 |
| 41 | 19.9930 5181 | 18.5661 0949 | 17.2943 6796 | 16.1574 6416 | 41 |
| 42 | 20.1856 2674 | 18.7235 4975 | 17.4232 0758 | 16.2629 9920 | 42 |
| 43 | 20.3707 9494 | 18.8742 1029 | 17.5459 1198 | 16.3630 3242 | 43 |
| 44 | 20.5488 4129 | 19.0183 8305 | 17.6627 7331 | 16.4578 5063 | 44 |
| 45 | 20.7200 3970 | 19.1563 4742 | 17.7740 6982 | 16.5477 2572 | 45 |
| 46 | 20.8846 5356 | 19.2883 7074 | 17.8800 6650 | 16.6329 1537 | 46 |
| 47 | 21.0429 3612 | 19.4147 0884 | 17.9810 1571 | 16.7136 6386 | 47 |
| 48 | 21.1951 3088 | 19.5356 0654 | 18.0771 5782 | 16.7902 0271 | 48 |
| 49 | 21.3414 7200 | 19.6512 9813 | 18.1687 2173 | 16.8627 5139 | 49 |
| 50 | 21.4821 8462 | 19.7620 0778 | 18.2559 2546 | 16.9315 1790 | 50 |

## PRESENT VALUE OF ANNUITY OF 1 PER PERIOD

$$a_{\overline{n}|i} = \frac{1 - (1 + i)^{-n}}{i}$$

| $n$ | 6% | 6½% | 7% | 8% | $n$ |
|---|---|---|---|---|---|
| 1 | 0.9433 9623 | 0.9389 6714 | 0.9345 7944 | 0.9259 2593 | 1 |
| 2 | 1.8333 9267 | 1.8206 2642 | 1.8080 1817 | 1.7832 6475 | 2 |
| 3 | 2.6730 1195 | 2.6484 7551 | 2.6243 1604 | 2.5770 9699 | 3 |
| 4 | 3.4651 0561 | 3.4257 9860 | 3.3872 1126 | 3.3121 2684 | 4 |
| 5 | 4.2123 6379 | 4.1556 7944 | 4.1001 9744 | 3.9927 1004 | 5 |
| 6 | 4.9173 2433 | 4.8410 1356 | 4.7665 3966 | 4.6228 7966 | 6 |
| 7 | 5.5823 8144 | 5.4845 1977 | 5.3892 8940 | 5.2063 7006 | 7 |
| 8 | 6.2097 9381 | 6.0887 5096 | 5.9712 9851 | 5.7466 3894 | 8 |
| 9 | 6.8016 9227 | 6.6561 0419 | 6.5152 3225 | 6.2468 8791 | 9 |
| 10 | 7.3600 8705 | 7.1888 3022 | 7.0235 8154 | 6.7100 8140 | 10 |
| 11 | 7.8868 7458 | 7.6890 4246 | 7.4986 7434 | 7.1389 6426 | 11 |
| 12 | 8.3838 4394 | 8.1587 2532 | 7.9426 8630 | 7.5360 7802 | 12 |
| 13 | 8.8526 8296 | 8.5997 4208 | 8.3576 5074 | 7.9037 7594 | 13 |
| 14 | 9.2949 8393 | 9.0138 4233 | 8.7454 6799 | 8.2442 3698 | 14 |
| 15 | 9.7122 4899 | 9.4026 6885 | 9.1079 1401 | 8.5594 7869 | 15 |
| 16 | 10.1058 9527 | 9.7677 6418 | 9.4466 4860 | 8.8513 6916 | 16 |
| 17 | 10.4772 5969 | 10.1105 7670 | 9.7632 2299 | 9.1216 3811 | 17 |
| 18 | 10.8276 0348 | 10.4324 6638 | 10.0590 8691 | 9.3718 8714 | 18 |
| 19 | 11.1581 1649 | 10.7347 1022 | 10.3355 9524 | 9.6035 9920 | 19 |
| 20 | 11.4699 2122 | 11.0185 0725 | 10.5940 1425 | 9.8181 4741 | 20 |
| 21 | 11.7640 7662 | 11.2849 8333 | 10.8355 2733 | 10.0168 0316 | 21 |
| 22 | 12.0415 8172 | 11.5351 9562 | 11.0612 4050 | 10.2007 4366 | 22 |
| 23 | 12.3033 7898 | 11.7701 3673 | 11.2721 8738 | 10.3710 5895 | 23 |
| 24 | 12.5503 5753 | 11.9907 3871 | 11.4693 3400 | 10.5287 5828 | 24 |
| 25 | 12.7833 5616 | 12.1978 7673 | 11.6535 8318 | 10.6747 7619 | 25 |
| 26 | 13.0031 6619 | 12.3923 7251 | 11.8257 7867 | 10.8099 7795 | 26 |
| 27 | 13.2105 3414 | 12.5749 9766 | 11.9867 0904 | 10.9351 6477 | 27 |
| 28 | 13.4061 6428 | 12.7464 7668 | 12.1371 1125 | 11.0510 7849 | 28 |
| 29 | 13.5907 2102 | 12.9074 8984 | 12.2776 7407 | 11.1584 0601 | 29 |
| 30 | 13.7648 3115 | 13.0586 7591 | 12.4090 4118 | 11.2577 8334 | 30 |
| 31 | 13.9290 8599 | 13.2006 3465 | 12.5318 1419 | 11.3497 9939 | 31 |
| 32 | 14.0840 4339 | 13.3339 2925 | 12.6465 5532 | 11.4349 9944 | 32 |
| 33 | 14.2302 2961 | 13.4590 8850 | 12.7537 9002 | 11.5138 8837 | 33 |
| 34 | 14.3681 4114 | 13.5766 0892 | 12.8540 0936 | 11.5869 3367 | 34 |
| 35 | 14.4982 4636 | 13.6869 5673 | 12.9476 7230 | 11.6545 6822 | 35 |
| 36 | 14.6209 8713 | 13.7905 6970 | 13.0352 0776 | 11.7171 9279 | 36 |
| 37 | 14.7367 8031 | 13.8878 5887 | 13.1170 1660 | 11.7751 7851 | 37 |
| 38 | 14.8460 1916 | 13.9792 1021 | 13.1934 7345 | 11.8288 6899 | 38 |
| 39 | 14.9490 7468 | 14.0649 8611 | 13.2649 2846 | 11.8785 8240 | 39 |
| 40 | 15.0462 9687 | 14.1455 2687 | 13.3317 0884 | 11.9246 1333 | 40 |
| 41 | 15.1380 1592 | 14.2211 5199 | 13.3941 2041 | 11.9672 3457 | 41 |
| 42 | 15.2245 4332 | 14.2921 6149 | 13.4524 4898 | 12.0066 9867 | 42 |
| 43 | 15.3061 7294 | 14.3588 3708 | 13.5069 6167 | 12.0432 3951 | 43 |
| 44 | 15.3831 8202 | 14.4214 4327 | 13.5579 0810 | 12.0770 7362 | 44 |
| 45 | 15.4558 3209 | 14.4802 2842 | 13.6055 2159 | 12.1084 0150 | 45 |
| 46 | 15.5243 6990 | 14.5354 2575 | 13.6500 2018 | 12.1374 0880 | 46 |
| 47 | 15.5890 2821 | 14.5872 5422 | 13.6916 0764 | 12.1642 6741 | 47 |
| 48 | 15.6500 2661 | 14.6359 1946 | 13.7304 7443 | 12.1891 3649 | 48 |
| 49 | 15.7075 7227 | 14.6816 1451 | 13.7667 9853 | 12.2121 6341 | 49 |
| 50 | 15.7618 6064 | 14.7245 2067 | 13.8007 4629 | 12.2334 8464 | 50 |

## VALUES OF $(1 + i)^{\frac{1}{p}}$

| $p$ | $\frac{1}{4}\%$ | $\frac{7}{24}\%$ | $\frac{1}{3}\%$ | $\frac{3}{8}\%$ | $p$ |
|---|---|---|---|---|---|
| 3 | 1.0008 3264 | 1.0009 7128 | 1.0011 0988 | 1.0012 4944 | 3 |
| $p$ | $\frac{5}{12}\%$ | $\frac{1}{2}\%$ | $\frac{7}{12}\%$ | $\frac{5}{8}\%$ | $p$ |
| 3 | 1.0013 8696 | 1.0016 6390 | 1.0019 4068 | 1.0020 7901 | 3 |
| $p$ | $\frac{3}{4}\%$ | $\frac{7}{8}\%$ | 1% | $1\frac{1}{8}\%$ | $p$ |
| 2 | 1.0037 4299 | 1.0043 6547 | 1.0049 8756 | 1.0056 0927 | 2 |
| 3 | 1.0024 9378 | 1.0029 0820 | 1.0033 2228 | 1.0037 3602 | 3 |
| 6 | 1.0012 4611 | 1.0014 5304 | 1.0016 5976 | 1.0018 6627 | 6 |
| $p$ | $1\frac{1}{4}\%$ | $1\frac{3}{8}\%$ | $1\frac{1}{2}\%$ | $1\frac{5}{8}\%$ | $p$ |
| 2 | 1.0062 3059 | 1.0068 5153 | 1.0074 7208 | 1.0080 9226 | 2 |
| 3 | 1.0041 4943 | 1.0045 6249 | 1.0049 7521 | 1.0053 8759 | 3 |
| 4 | 1.0031 1046 | 1.0034 1992 | 1.0037 2909 | 1.0040 3798 | 4 |
| 6 | 1.0020 7256 | 1.0022 7865 | 1.0024 8452 | 1.0026 9018 | 6 |
| 12 | 1.0010 3575 | 1.0011 3868 | 1.0012 4149 | 1.0013 4418 | 12 |
| $p$ | $1\frac{3}{4}\%$ | 2% | $2\frac{1}{4}\%$ | $2\frac{1}{2}\%$ | $p$ |
| 2 | 1.0087 1205 | 1.0099 5049 | 1.0111 8742 | 1.0124 2284 | 2 |
| 3 | 1.0057 9963 | 1.0066 2271 | 1.0074 4444 | 1.0082 6484 | 3 |
| 4 | 1.0043 4658 | 1.0049 6293 | 1.0055 7815 | 1.0061 9225 | 4 |
| 6 | 1.0028 9562 | 1.0033 0589 | 1.0037 1532 | 1.0041 2392 | 6 |
| 12 | 1.0014 4677 | 1.0016 5158 | 1.0018 5594 | 1.0020 5984 | 12 |
| $p$ | $2\frac{3}{4}\%$ | 3% | $3\frac{1}{4}\%$ | $3\frac{1}{2}\%$ | $p$ |
| 2 | 1.0136 5675 | 1.0148 8916 | 1.0161 2007 | 1.0173 4950 | 2 |
| 3 | 1.0090 8390 | 1.0099 0163 | 1.0107 1805 | 1.0115 3314 | 3 |
| 4 | 1.0068 0522 | 1.0074 1707 | 1.0080 2781 | 1.0086 3745 | 4 |
| 6 | 1.0045 3168 | 1.0049 3862 | 1.0053 4474 | 1.0057 5004 | 6 |
| 12 | 1.0022 6328 | 1.0024 6627 | 1.0026 6881 | 1.0028 7090 | 12 |
| $p$ | 4% | $4\frac{1}{2}\%$ | 5% | $5\frac{1}{2}\%$ | $p$ |
| 2 | 1.0198 0390 | 1.0222 5242 | 1.0246 9508 | 1.0271 3193 | 2 |
| 3 | 1.0131 5941 | 1.0147 8046 | 1.0163 9636 | 1.0180 0713 | 3 |
| 4 | 1.0098 5341 | 1.0110 6499 | 1.0122 7223 | 1.0134 7517 | 4 |
| 6 | 1.0065 5820 | 1.0073 6312 | 1.0081 6485 | 1.0089 6339 | 6 |
| 12 | 1.0032 7374 | 1.0036 7481 | 1.0040 7412 | 1.0044 7170 | 12 |
| $p$ | 6% | $6\frac{1}{2}\%$ | 7% | 8% | $p$ |
| 2 | 1.0295 6301 | 1.0319 8837 | 1.0344 0804 | 1.0392 3048 | 2 |
| 3 | 1.0196 1282 | 1.0212 1347 | 1.0228 0912 | 1.0259 8557 | 3 |
| 4 | 1.0146 7385 | 1.0158 6828 | 1.0170 5853 | 1.0194 2655 | 4 |
| 6 | 1.0097 5879 | 1.0105 5107 | 1.0113 4026 | 1.0129 0946 | 6 |
| 12 | 1.0048 6755 | 1.0052 6169 | 1.0056 5415 | 1.0064 3403 | 12 |

# INDEX


Accelerated depreciation, 461
Accommodation paper: 258–260; where accommodation party is endorser of instrument, 259–260; where accommodation party is maker of instrument, 259
Accountancy dividend restrictions, 186
Accountancy dividend standards: 184–191; availability of donated surplus, 187–188; availability of earned surplus for distribution, 185–186; availability of paid-in surplus, 186–187; availability of reserve for unrealized appreciation (revaluation surplus), 188–189; capital returned to stockholders account, 191; depletion, 191; operating deficit and dividends, 189–191; reserve for depletion account, 191; Treasury Department ruling, 191
Accountant's activity with appraisals: limitation of, 218–219
Accounting: approaches to, 20; entity theory, 20–25; proprietary theory, 20–25
Accounting for blocks of securities combined by reorganization, 257
Accounting for cost of moving fixed assets, 295–296
Accounting for securities: acquisition prior to March 1, 1913, 257–258; adjustments to original tax basis, 257; dividends, 241; privileged subscriptions, 249–250; stock rights, 250–255; taxation, 241
*Accounting Research Bulletin:*
No. 1: 72, 93, 102
No. 2: 455
No. 3: 117–118, 364
No. 4: 519, 523, 525, 533, 534
No. 5: 351, 361, 362, 365
No. 7: 3
No. 8: 140, 157, 436
No. 9: 111
No. 11: 198, 199
No. 12: 111
No. 13: 127
No. 18: 455
No. 20: 460
No. 22: 371, 460
No. 23: 113–114, 114–116
No. 24: 322, 494
No. 27: 371, 380, 381
No. 28: 156, 157, 176–177
No. 29: 425
No. 30: 173
No. 31: 155, 156, 157
No. 32: 156, 157, 433, 438–441
No. 33: 156, 157, 460, 461
No. 34: 150–152
No. 35: 156, 177
No. 36: 448, 449
No. 37: 492–494
No. 38: 317–318
No. 39: 128, 177
*Accounting Series Release:*
No. 1: 101
No. 5: 72
No. 6: 102
No. 9: 40, 187
No. 15: 101, 118
No. 16: 101, 119
No. 25: 101, 120
No. 35: 185
No. 45: 32, 82, 102
No. 53: 114
No. 68: 56
Accounting statements: effect of inflation on, 547
Accounts: appraisal, 359–370; balance sheet stabilization, 556; capital price adjustment, 565; capital returned to stockholders, 191; capital stock, 93; capital surplus, 120; costs of securing capital, 68; deferred salary expense, 490; donated land reserve, 406; donated surplus, 123; earned surplus, 95; exchange adjustment, 517–518, 532–534; incorporation costs, 68; interest on investment, 164; no-par capital stock, 67; no-par preferred capital stock, 116; organization costs, 67; paid-in surplus, 102, 108, 125; reserve for amortized appreciation in inventories, 167–168; reserve for amortized cost credit adjustments in inventories, 169; reserve for amortized cost debit adjustment in inventories, 168; reserve for amortized devaluation in inventories, 168–169; reserve for cash discounts on purchases, 170; reserve for cotton futures, 157; reserve for depletion, 191; reserve for depreciation, 158–159; reserve for doubtful accounts, 158; reserve for fire (or other casualty) loss, 173; reserve for income taxes (current year), 171–172; reserve for interdepartmental profit in inventories, 161–164; reserve for over-

valuation of assets, 81; reserve for pensions, 173; reserve for predictable losses on guarantees, 172; reserve for predictable obsolescence, 159; reserve for purchased treasury stock, 95; reserve for repairs, 172–173; reserve for self-insurance, 173; reserve for shortage and damage in work in process, 154; reserve for shortages in materials and supplies, 153; reserve for unrealized appreciation, 175; reserve for unrealized profit in branch inventory, 160–161; right of way, 296; stabilization profit and loss, 556; suspense — capital stock overissued, 99; treasury stock, 99; treasury stock pledged as collateral, 99; unissued capital stock, 93; unrealized gross profit on installment sales, 109; unrealized surplus, 175
Accretion, 407–408
Accumulated depreciation adjustments: 371–374; balance sheet presentation of, 378–379; caused by decrease in service life, 376–378; caused by increase in service life, 374–376; income tax procedure, 373; journalization of, 374–378; recording of, 371–374
Agency: foreign, 528
Aggregate proprietary capital deduction theory of treasury stock: 75; corporation's treatment of, 75; illustration, 75; Securities and Exchange Commission's provision for, 76
American Accounting Association, 23, 31, 110
American Accounting Association Executive Committee, 31, 72, 75, 78, 79, 110, 111, 361, 389, 431, 434, 463, 464
American Appraisal Company: appraisal report of, 352–356
American Institute of Accountants, 76, 110, 111, 113, 117–118, 150–152, 155–157, 176–177, 186, 351–357, 371–372, 394, 397, 399, 448
American Institute of Accountants (Committee on Accounting Procedure), 113, 317, 322, 357, 361, 362, 364, 371, 425–431, 438, 448–449, 454–455, 460–461, 463, 492–494, 523, 533–534
American Institute of Accountants (Committee on the Definition of Earned Surplus), 120
American Institute of Accountants (Committee on Terminology), 110, 111, 150, 152, 459–460
American Institute of Accountants (Research Department Findings), 114, 186, 318–319, 357–358, 435–436, 449–450, 526, 561
Amortization of debt: basic variations of, 236; compared with ordinary funding of a liability, 235; expense-income figures in, 237; illustrative problem, 236–237; interest payment on, 239; meaning of, 235; redemption money, 239; special formulas for, 238–239
Amortization of intangible assets, 321–325
Amortization-plan mortgages: 284–288; when yield is known, 287; when yield is unknown, 287–288
Annual bonds, 276
Annuities: as leases, 313; installment payments of deferred, 240; principles underlying, 234; purchased as investment, 239–240; special debt amortization, 239; when payment and conversion periods coincide, 216–217
Annuities and perpetuities when periodic payments are $1: equations for, 211–213; estimations of rate, 212
Annuity: compound amount of, 208–209; present worth of, 209–210; when each payment is $1, 208–210; when payments form arithmetic progression, 218; when payments form geometric progression, 217–218
Annuity bonds, 280–281
Annuity (ordinary): when interest rate changes, 216–217
Appraisal report, 352–356
Appraisals: 351–391; balance sheet treatment, 367–368; disposal of assets which have been appraised, 369; donated fixed assets, 389–391; *see also* fixed asset appraisals
Appraisals, fixed assets: advisability of recording, 351–357; effects of recording appreciation on income and earned surplus, 359–363; income tax regulations, 358–359; report, 351–356; statistics on valuation bases for, 357–358
Appreciated fixed assets: disposal of, 369
Appreciation: absorbed, 362; stabilized accounting for, 552–554
Appreciation, unrealized: all capital theory of, 28–29; capital arising from, 27–28; part income theory of, 28; surplus theory of, 29; three theories of, 28–29
Appropriated earned surplus reserves: 175–177; American Institute of Accountants, 176–177; for possible losses, 175–

177; for other purposes, 177; true surplus reserves, 177
Appropriated surplus, 110
Assets, high cost, 460–461
Asset theory of treasury stock, 73–74
Axioms: 519; of foreign exchange conversion, 519

Babcock method, 328–335, 336–340
Balance sheet: effects of inflation on, 548; full disclosure, 59; payment of capital stock, 57–58; treasury stock surplus deduction theory, 74–75; treatment of appraisal accounts, 367–368
Balance sheet presentation: accumulated depreciation adjustments, 378–379
Balance sheet stabilization: steps involved in, 556
Basis of taxation: 11; corporations, 11; ordinary, limited, or mining partnerships, 11; partnership associations, 11
Basket purchases, 401
Bonds: 266–283; acquisition by issuing corporation for sinking fund, 258; annual, 276; annuity, 280–281; bought or sold on yield basis, 270–271; calculating machine method, 273; compound interest method, 273; determination of yield for, 272–274; discount on callable, 457; elimination of residues method, 274; financial decisions concerning, 281–283; irredeemable, 276; iteration method, 273; option to call, 281; ordinary semiannual, 267–270; partial redemption of, 271–272; purchased with interest in default, 258; quarterly, 276; retiring and refunding, 450–457; rule of thumb method, 272; serial, 276–280; short terminal, 275–276; statistics on accounting for, 455–456; yield for, 272
Bonds purchased flat, 258
Bonus stock, 45
Book value of capital stock: 144–147; common stock, 145; preferred stock, 145
Boston rights, 251
Branches: foreign, 515–546
Budgetary-liability reserves: 171–174; reserve for fire (or other casualty) loss, 173–174; reserve for income taxes (current year), 171–172; reserve for pensions, 173; reserve for predictable losses on guarantees, 172; reserve for repairs, 172–173
Budgetary-valuation reserves: 158–159; reserve for depreciation, 158–159; reserve for doubtful accounts, 158; reserve for predictable obsolescence, 159
Buildings: of lessee reverting to lessor, 406–408; valuation of, 343–350
Bulletins: (*see Accounting Research Bulletins*)
Bureau of Internal Revenue: cotton futures, 154
Business capital: outside equities of, 27; proprietary theory, 27
Business entities: 3–25; *Accounting Research Bulletin*, No. 7, 3; definition, 3; multi-owned business organization, types of, 4; Securities and Exchange Commission, 3
Business income: determination by periodicity factor, 413; managerial approach, 392–393; nature of, 392; proprietary approach, 392–393
Business trusts: beneficiaries' limitation in, 9; concept of legal entity of, 18–20; continuity of existence, 9–11; Massachusetts trusts, 6; organization of, 6; power of board of trustees in, 9

Calculating machine method, 273–274
Call accounts, 48
Canadian subsidiary, 543–546
Capital: 107; business, 27; concepts of, 26; contributed, paid-in, or invested, 30–33; earning power, 30; economics of, 26–27; legal or stated, 34–38; origin of, 26; price adjustment method, 564–566; stabilized accounting concept of, 540–551; varieties of, 26
Capital arising from non-owners: 29–30; components to be deducted, 30; components to be included, 29
Capitalization: definition of, 38
Capitalization and amortization: need for mathematical simplicity, 204
Capital maintenance: and stabilized accounting, 549–551; depreciation, 458–462; variations in meaning of, 458
Capital price adjustment, 565
Capital stock: as to assets in liquidation, 40; as to cumulative dividends, 39; as to par value, 38–39; as to participating dividends, 40; as to status, 39; as to voting, 39; book value of, 144–147; conversion, 525; debenture, 40; deferred, 40; fraud doctrine, 54; good faith rule, 54; guaranteed, 40–41; how issued, 54; on balance sheet, 57–58; payment for, 54–65; premium and discount, 123–125;

reservations, 65; retirement of, 99–106; suggested bases for, 56; true value rule, 54; value received, 54
Capital stock retirement taxability: 106; Internal Revenue Code, 106
Capital surplus: 29, 120; as an account title, 120
Cash: capital stock issued for, 54
Changes in service life: conclusions on, 379–380
Committee on Terminology: *see* American Institute of Accountants (Committee on Terminology)
Common dollar reporting, 566
Compound interest methods, 219
Concept of legal entity: 15–20; business trusts, 18–19; joint stock companies, 18; partnership associations, 18; "partnership entity," 16–17; statutory and limited partnerships, 17; syndicates, 17; Uniform Partnership Act, 16
Condition per cent, 351
Conservative business policy, 417–419
Consignment sales: accounting for, 494–498
Consolidation of statements: of foreign subsidiaries and parent company, 536–539
Construction contracts: accounting for, 498–513; in progress on balance sheets, 503–514; in relation to periodicity of income, 500–501; reporting periodic revenue under percentage-of-completion method, 501–502; retained percentages or amounts, 502; types of, 499–500
Construction of fixed assets: preferred dividends during, 195–196
Containers: 310–313; (*see also* returnable containers)
Contingency reserves, 175–177
Continuity of existence: 9–11; business trust, 10; joint stock companies, 10; limited partnership, 10; mining partnership, 10; ordinary partnership, 9; private corporations, 10–11; syndicates, 10
Contractor: definition of, 499
Contracts: governing different types of business organizations, 4; (*see also* construction contracts)
Contributed capital: 31–34; accounts for, 32–34; components to be deducted, 31; components to be included, 31
Contributions for extension, 123
Conversion of foreign account balances: 519–526; capital stock, 525; deferred charges, 522–523; fixed assets, 519–521; fixed liabilities, 523–525; merchandise, 521–522; nominal accounts, 525–526; paid-in surplus, 525; reciprocal accounts, 526; sinking funds, 523; under assumptions, 519
Copartnership: articles of, 4
Corporate dividends: general, 178; legal and accounting aspects, 178–203
Corporate franchise: costs of, 68
Corporate stockholders: liabilities of, 14; special, 15; subscription, 14–15
Corporate surplus administration, 184
Corporations: basis of taxation, 11; organization costs, 65–69; private business, 7
Cost credit adjustment, 351–377
Cost debit adjustment, 351–375
Cost of moving fixed assets: accounting for, 295–296
Cost or market, whichever is lower, 423–425
Costs: definition of, 416–417
Costs of incorporation, 66
Cotton futures, 154
Current asset conversion, 521–522
Current assets: Securities and Exchange Commission, *Regulation S–X*, 60
Current liabilities, 62

Dated earned surplus, 116–120
Debt retirement: 231–239; amortization of debt, 235–239; for serial bonds, 233–234; mathematics of, 231–239; periodic, 231–239; sinking fund mathematics of, 231; when interest rates change, 233; when payments vary, 234–235
Dedicated capital, 30
Deferred charge conversion, 522–523
Deferred income, 63
Deferred payment plan, 484–485
Deferred salary expense, 490
Depletion: 191; under Hoskold formula, 306–307
Depreciation: actuarial methods for, 301–313; adjustment of accumulated depreciation, 371–374; annual charge, 304; constant percentage on diminishing base method, 304–306; in expanding business, 297–299; journal entries for expense of, 303–304; sinking fund, annuity, and compound interest, 301–304; stabilized, 551–552; stabilized accounting for, 551–552; under group system, 307–310; units of output method, 299
Depreciation accounting: American Institute of Accountants, 371–372, 460–461

Depreciation adjustments: changes in service life, 371–380
Depreciation expense: journal entries for, 303
Depreciation schedule, 299–301
Devaluation: in relation to stabilized accounting, 553
Direct charges and credits: earned surplus or retained income, 111
Discount: on callable bonds, 457
Dividend dates: date dividend taxable, 194; date of declaration of, 193–194; date of identification of distributees, 194; date of payment, 194
Dividend regulation: purposes of, 178–179
Dividend rights: treasury stock, 72
Dividends: directors' discretion, 191–193; from paid-in surplus, 195; from proceeds of life insurance policies, 195; from surplus at acquisition of subsidiary, 195; in property which has appreciated in value, 202–203; of holding companies, 196; passed cumulative at acquisition, 249; property, 405–406; restrictions on, 179–184; stock, 202; taxation of, 241–245; with dividends, 195
Doctrine of conservatism, 417–419
Donated assets: cash gift followed by asset purchase, 391; conditional titles, 390; depreciable variety, 389–391; post-acquisition expenditures, 390
Donated surplus, 122–123, 406
Donated treasury stock: 91–93; American Institute of Accountants, 93; capital stock account, 93; general, 91; unissued capital stock account, 93
Donations from stockholders: 125; paid-in surplus account, 125
Donations of assets, 406–407
Donations of fixed assets, 389–391
Double liability, 15
Dummies: concept of legal entity, 19

Earned surplus: 110–116; effect of devaluation on, 364–365; effects of recording appreciation on income and, 359–363; statistics on direct charges and credits to, 447–448
Earned surplus conversion, 525–526
Earned surplus or retained income: American Accounting Association (Executive Committee), 110; American Institute of Accountants (Committee on Accounting Procedure), 113; American Institute of Accountants (Committee on Terminology), 110; definition of, 110; desirability of the term, 111; direct charges and credits, 111; frozen earned surplus, 116; income taxes, 112–116; Securities and Exchange Commission, 114
Earning power, 30
Earnings and profits, 241–242
Economic capital, 26–27
Economic income, 392
Effective and nominal interest rates: relationship between, 207
Emergency facilities: depreciation of, 380–381
Employee pensions: American Institute of Accountants, 449–450; and periodic income, 448–450; statistics on treatment of, 449–450
Employee stock options: 65; accounting for, 489–491; American Institute of Accountants, 492–494
English subsidiary, 539–543
Entities: business and accounting, 3–25
Entity equity theory, 79
Entity theory: 20–25; contrasted with proprietary theory, 21–22; profit or loss, 25
Equalizing reported income: American Institute of Accountants, 463–464; other authorities, 464
Equity adjustment, 78–79
Equity in donated land, 406
Evaluation of income-producing property: 219–225; formulas for, 221–225; illustrations, 221–222; income defined, 219; methods for, 219; rates of interest, 220–221; repayment of principal, 219–220
Exchange adjustment account, 517–519, 532–534
Exchange conversion rates: after devaluation of foreign currencies, 526–528
Exchanges: property for stock in corporation, 386–389
Expanding business: depreciation in, 297–299
Expense: definition of, 416–417
Expired cost: definition of, 416–417
Exploratory costs, 60–62
Ex-rights, 251

Fees: leasehold, 341–344; valuation of, 341–344
Fee simple title: Babcock method, 328–335, 336–340; Kniskern method, 327–328, 335–336; with building not of highest and best use, 335–339; with building of highest and best use, 327–335
Financial decisions concerning bonds, 281–283

Financial statements: worksheets for correcting, 133–140
Fixed and intangible assets at cost: planning fixed asset additions to, 292–295
Fixed asset appraisals: 351–391; adjustments of accumulated depreciation, 371–374; quasi-reorganization procedure, 375, 377
Fixed asset conversion, 519–521
Fixed assets: depreciation based on units of output, 299; depreciation in expanding business, 297–299; depreciation schedule, 299–301; donation of, 389–391; involuntary conversion of, 296–297; planning additions to, 292–295; returnable containers, 310–313
Foreign exchange conversion, 519–526
Formulas, 208, 213, 217–218, 219, 226–239, 253–255, 270–280, 326–350, 450–457

Good faith rule, 54
Governing contract: business trusts, 6; joint stock companies, 5–6; mining partnerships, 5; ordinary or general partnerships, 4; partnership associations, 6; private business corporations, 7; statutory limited partnerships, 4–5; syndicates or joint ventures, 5; types of, 4
Grimes and Craigue Method, 219
Group system depreciation, 307–310
Growth factor, 298
Guaranteed dividends, 196
Guaranteed income: worksheet for determination of, 408–412

High asset cost and depreciation expense, 460–462
Hire-purchase agreements: accounting for on lessee's books, 320; definition of, 319–320; illustrative problem, 320; mathematical principles, 320
Hoskold formula: criticism of, 227; depletion under, 306–307; uses for, 227; use with leases, 226; use with wasting assets, 225–226
Hoskold-O'Donohue method, 219
Hybrid reserves, 149

Illustrations: annuities, 217–218; debt retirement, 232–233; deferred annuities, 240; equations for annuities and perpetuities, 211–212; evaluation of income-producing property, 221–222; perpetuities as investments, 240; reconciliation of surplus and reported profits, 424; redemption money, 239; reservations of capital stock, 65; speculative interest rate, 228; statement of surplus, 141–142; stock purchase warrants, 256; stock rights, 253–255; unmatured bonds, 271–272; worksheet for determining amount of guaranteed income, 409–412
Implied partnerships, 4
Imputed costs: relation to periodic income, 464–465
Income: as distinguished from savings, 404–405; effect of devaluation on, 364–365; effects of recording appreciation on, 359–363; from accretion, 407–408; guaranteed, 408–410; matching of expenses and revenues, 415–417; nature of, 392–393; periodic, 413–414; realization of, 401–404; stabilized accounting concept of, 554–555; Treasury Department, 408; unusual problems of realization of, 405–408
Income determination: premises for, 400–404
Income reporting: balance sheet, 393; implications of modern emphasis on, 393–394; income statement, 394; income statement terminology, 396–397
Income statement: American Institute of Accountants, 397; single step versus multiple step, 397–399; terminology of, 396–397; three part, 566–570
Income tax: earned surplus, 112–116; foreign transactions, 534–535
Incorporation of firm with depreciable or depletable assets, 386–389
Index ratio, 558
Industrial bank loans: illustrative problems, 290; interest rates for, 290
Inflation: effects upon balance sheet, 548–549; effect upon usefulness of accounting statements, 547
Initial payments, 478
Installment contracts: illustrative problems, 290–291; interest rates for, 290–291
Installment method: costing for real estate subdivisions, 487–489; for personal property sales, 465–478; for real estate sales, 478–487
Installment obligations: disposition of, 482–483
Installment payment on subscription: stock forfeited, 48–51
Insurance proceeds, 296–297
Intangible assets: amortization of, 321–325; discussion, 323–325; leases, 313

Interest: payment by sinking fund, 239
Interest in default: 258; bonds purchased with, 258
Interest on investment account, 164
Interest rates: for industrial bank loans, 290; installment contracts, 290–291; relationship between effective and nominal, 207
Inventory realization in relation to periodic income, 419–431
Inventory replacement costs and periodic income: 422–431; American Accounting Association Executive Committee, 431; American Institute of Accountants, 425–431
Investments: noncurrent assets, 265
Involuntary conversion of fixed assets: 296–297; entries for, 297
Irredeemable bonds, 276
Issue equity theory, 79
Issuer's entries for stock dividends: 196–200; alternate procedures, 197–198; American Institute of Accountants (Committee on Accounting Procedure), 198–199; illustration, 197; rights of preferred stockholders to stock dividends, 200; stock split, 198
Iteration method, 273–274

Joint stock companies: 5–6; articles of association, 6; concept of legal entity, 18; definition of, 5–6; ownership of, 6; power of shareholders in, 9; state statutes governing, 6
Journal entries: no-par shares, 52
Journalization of treasury stock: comparative transactions, 77–78; entity equity, 79; recommended entries, 81–85; stock-class distinction, 80–81

Kniskern's method, 327–328, 335–336
Kreuger and Toll case, 24

Land: valuation of, 347–350
Leased fees, 341–344
Leasehold estates: 344–350; appraisal of, 344; Babcock method, 344
Leases: 313–319; as annuities, 313; disclosure of present worth of future rentals due, 318; financial statement presentation for long-term, 316–319; long-term, 316–318; of buildings, 406; payments in lieu of rent, 313–314; periodic rent when lessee makes improvements, 315–316; premium for renewal of, 316; valuation of, 314–315
Leases, long-term: 316–319; disclosure on balance sheet, 318–319
Legal capital: 34–38; allocation limitations of, 36–37; as of definite date, 35–36; contrasting viewpoints, 37–38; forfeited stock subscriptions, 48; illustration, 38; in event of deficit, 35; of a corporation, 34
Legal entity: 15–20; definition, 15; qualifying features or "tests" of, 15–16
Liabilities: corporate stockholder, 14–15
Limitation of accountant's activity with appraisals, 218–219
Limited: meaning of, 12
Limited partnerships: basis of taxation, 11; continuity of, 10
Loans: on discount basis, 260–264
Long-term debt, 63
Long-term leases, 316–319
Loss: definition of, 417
Loss from devaluation of foreign currency, 526–528
Lucky buys, 405
Lump purchases, 401

Maintenance of capital, 24, 458
Makeham's formula for valuing loans: 229–231; illustrative problems, 229–231
Matching problem, 414–415
Mathematical aspects of capitalization and amortization: single payment, 205–207
Mathematical limitation: 35; definition of, 35
Mining partnerships: basis of taxation of, 11; concept of legal entity of, 17; continuity of existence, 10; organization of, 5
Minority interests, 196
Morkill method, 219
Mortgages: amortization-plan, 284–289; investments in, 285–288; kinds of, 283; serial-plan, 283–284
Moving fixed assets: accounting for cost of, 295–296
Multi-owned business organizations: types of, 4
Multi-owned enterprise: seat of authority, 7; power of agent of, 7
Multiple step statement, 397–399

National Industrial Conference Board: depreciation expense in period of high asset cost, 460
Net assets: business capital, 27
Net cash proceeds, 67

Net cost value, 351
Net income: premises for determination of, 400–404
New York Stock Exchange, 43
Nominal dollar, 543–546
Noncurrent asset investments: valuation of, 265–266
Non-surplus reserves, 148–177
No-par forfeited stock, 53–54
No-par shares: journal entries, 53
No-par treasury stock: entries for purchased, 86–91
No-par value capital stock: opening entries for, 51–53; stated value, 52
Notes: purchased on discount basis, 260–264
Notes discounted: discussion of, 260–264

Obligations: installment, 482–483
Offset theory of treasury stock, 74
One-man corporations, 19
Opening entries for par value capital stock: 43–51; complexities affecting, 44–51; illustration, 43–44; variations of, 44–51
Operational income, 569
Options: employee stock, 65, 489–494
Ordinary partnership: authority of partner in, 7–8; basis of taxation of, 11
Ordinary semiannual bonds: evaluation of, 267; formulas for, 267; illustrative problem, 267–270
Organization costs: 65–69, 124; charging to earned surplus account, 67; classification of, 65–66; costs of incorporation, 66; difference of organization expenditures from, 68; income tax decisions pertaining to, 66; net cash proceeds, 67; no-par capital stock account, 67; recommended procedure, 68–69; Securities and Exchange Commission analysis of, 66

Paid-in capital: meaning of, 31–32
Paid-in surplus: 45, 120–122; accounting for, 32–34; capital surplus account, 121–122; definition of, 120; from forfeited subscription, 125; from present common stockholders, 33; from present no-par stockholders, 52; from present preferred stockholders, 32; from present stockholders, 124; miscellaneous, 33–34, 121; Securities and Exchange Commission, 32; terminology survey of, 121
Partnership associations: 6; basis of taxation, 11; concept of legal entity of, 18; definition, 6; interstate business of, 6; states' recognition of, 6
Partnership closing entries, 47
Partnerships: authority of partner in ordinary partnership, 7–8; by estoppel, 4; implied, 4; incorporation of, 386–389; mining, 5; ordinary creation of, 4; partnership entity, 16–17; statutory limited, 4–5, 8
Par value capital stock: incorporation of partnership or individual proprietorship, 46–47; installment payment on subscription, 48; noncash payment of subscription, 46; original opening entries for, 43–51; partial payment of subscription, 46; sale of portion of authorized stock, 44; sale of preferred stock with bonus payable in common stock, 45; sale of stock at discount, 44–45; sale of stock at premium, 45; sold under lien, 50–51; stock forfeited, 48–51
Passed cumulative dividends: at acquisition, 249
Payment for capital stock: responsibility of accountant, 55; responsibility of board of directors, 54; internal accountant, 55; Securities and Exchange Commission, 55–56
Pension charges and credits: statistics on treatment on financial statements, 449–450
Percentage-of-completion method, 501–514
Periodic income: and employee pensions, 448–450; capital maintenance and, 458–460; distinction between costs, expenses, and losses, 416–417; employee stock options, 489–494; equalizing reported, 462–464; importance of problem of, 413–414; installment sales of personal property and, 465–478; inventory realization in relation to, 419–431; inventory replacement cost and, 422–431; matching problem, 414–415; relation of conservatism to, 417–419; relation of imputed costs to, 464–465; retiring and refunding bonds, 450–457; techniques for matching, 415–416; unusual gains and losses and, 431–441
Periodicity factor of income, 413–514
Perpetuities: as investments, 240; equations for, 211–213; present worth of, 210–211; when each payment is $1, 210–213
Philadelphia rights, 251
Planning fixed asset additions, 292–295

Policy adjustment reserves, 569
Pre-emptive right: 250; treasury stock, 72
Preferred dividends during construction of fixed assets, 195–196
Preferred stock: passed cumulative dividends at acquisition, 249
Preferred stock retirement: discounts, 101; journal entries, 103–104; paid-in surplus account, 102; Securities and Exchange Commission, 101–102
Premium and discount on capital stock: 123–125; Federal Power Act, 123; past practices, 124–125
Premiums: for lease renewals, 316; on callable bonds, 457
Preservation or maintenance of capital, 24, 458
Private business corporation: 7; charter of, 7; continuity of existence, 10–11; legal status of, 7; ownership in, 7
Privileged subscriptions: 249–250; purpose, 249
Promotional costs, 61, 65
Properties: positive items of, 27
Property: capital stock issued for, 54
Property dividends: general, 247–248; payable in bonds, 248–249; payable in scrip, 248; payable in treasury stock, 248
Proprietary and entity theories of accounting: 20–25; general discussion, 22–23; outline, 20–22; some implications of the two theories, 23–25
Proprietary equity increase, 400
Proprietary theory: 20–25; contrasted with entity theory, 21–22; profit or loss, 25
Purchase syndicates, 5
Purchasing power, 552–553
Pure budgetary reserves: 152–154; reserve for shortages in materials and supplies account, 153–154
Pure valuation reserves: 154–157; Bureau of Internal Revenue, 154; reserve for cotton futures, 157; reserve for inventory decline, 155–157
Purposes of dividend regulation, 178–179

Quasi-reorganization, 361, 375, 377
Quasi-reorganization and dated earned surplus: 116–120; American Institute of Accountants (Committee on Accounting Procedure), 117–118; Securities and Exchange Commission, 118–120

Rates: foreign exchange, 519–526
Reacquired shares, 70
Real estate sales: installment method, 478–487
Real estate subdivisions: costing for, 487–489
Real property: determining value of, 326–350; fee simple title, 327–355; total return on, 326–327
Reappraisal of appraisal, 368–369
Reappraisal surplus, 125
Recapitalization: 125–127; change from no-par to par value stock, 126–127; change from par value to no-par value, 126; reduction in par, or stated, value without proportionate increase in number of shares, 125–126
Recapitalization surplus, 32
Reciprocal accounts, 526
Reconciliation of surplus and reported profits: 129–132; correction of income taxes, 132; direct items schedule, 132; relation to ordinary financial statement worksheets, 132
Recording transfer of treasury stock, 99
Redemption money: formula for, 239
Relative sales value method: for real estate subdivision, 487–489
Renewals: lease, 316
Rent: sitting, 315
Rentals: valuation of, 344–350
Rents: payment in lieu of, 313–314
Reorganizations, 116, 257, 361, 375
Replacement fund, 296
Repossessed real estate, 483
Research bulletins: (*see Accounting Research Bulletins*)
Reservations of capital stock: 65; employee options, 65; illustration, 65
Reserve for amortized appreciation in inventories, 167–168
Reserve for amortized cost credit adjustment in inventories, 169
Reserve for amortized cost debit adjustment in inventories, 168
Reserve for amortized devaluation in inventories, 168–169
Reserve for cash discounts on purchases, 170
Reserve for cash discounts on sales, 170
Reserve for depreciation, 158–159
Reserve for donated land, 406
Reserve for doubtful accounts, 158
Reserve for exchange fluctuations, 532–534
Reserve for fire (or other casualty) loss, 173
Reserve for imputed interest on investment in inventories, 164–167

Reserve for income taxes (current year), 171–172
Reserve for interdepartmental profit in inventories, 161–164, 165
Reserve for pensions, 173
Reserve for predictable losses on guarantees, 172
Reserve for price adjustment, 565
Reserve for purchased treasury stock: 93–98; accountant's responsibility, 95–96; out of surplus, 95; state legislation, 94
Reserve for repairs, 172–173
Reserve for self-insurance, 173
Reserve for shortage and damage in work in process account, 154
Reserve for unrealized appreciation, 175, 363–369
Reserve for unrealized profit in branch inventory, 160–161
Reserves: American Institute of Accountants (Committee on Terminology), 150–152; budgetary-valuation (*see* budgetary-valuation reserves); classes of, 152; hybrids, 149–150; interpretation of, 148; introductory, 148–152; pure budgetary (*see* pure budgetary reserves); pure valuation (*see* pure valuation reserves); valuation-budgetary (*see* valuation-budgetary reserves)
Restrictions on dividends: common law and statutes, 179–184; Uniform Business Corporation Act, 183–184
Résumé of surplus classifications, 123
Retained percentages, 502–503
Retirement of bonds, 282–283
Retirement of capital stock: 99–106; common stock, 100; general, 99–100; preferred stock, 100–106
Returnable containers: no deposit for, 310; sent out on deposit, 311–313; sold with promise to repurchase, 310–311
Revaluation surplus, 125, 361–362
Reversal of stock dividend, 202
Revision of service life, 371–379; conclusions, 379–380
Right of way, 296
Rights of stockholders to stock dividends, 200
Rights-on, 251 (*see also* stock rights)

Sale basis: of income determination, 401–403
Sale of illegally acquired treasury shares: 99; suspense — capital stock overissued account, 99
Sale of treasury shares purchased at several dates, 91
Savings: as distinguished from income, 404–405
Schurig-Baily formulas, 213
Seat of authority, 7–9; in ordinary partnership, 7–8; multi-owned enterprise, 7; statutory limited partnership, 8
Secret reserves, 128–129
Securities and Exchange Commission, 3, 32, 55, 66, 67, 76, 93, 101–102, 114, 118–120, 127, 141, 143, 185, 400, 442, 443–444, 446–447, 454; *Regulation S–X*, 317, 360; *Regulation S–X*, Article 5-A, 59–65
Selling syndicates, 5; types of, 5
Serial bonds: evaluation of, 276–280; methods for amortization of, 278–280; yield of, 280
Serial-plan mortgages, 283–284
Service life: changes in, 371–380
Services: capital stock issued for, 54
Short terminal bonds, 275–276
Single step statement, 397–398
Sinking fund: bonds acquired by issuing corporation for, 258; for serial bonds, 233–234; interest paid by, 239; mathematics of, 231–239; principles underlying, 234; when interest rates change, 233; when payments vary, 234–235
Sinking fund conversion, 523
Sitting rent, 315
Smoothing reported income, 462–464
Sound value, 351
Special capital reserve method: of stabilized accounting, 570–571
Special liability: double, 15
Speculative interest rate: computation of, 228–229; factor of safety, 228; illustration, 228; need for, 227–228
Stabilized accounting: 392; alternative methods based on, 563–564; appreciation, 552–554; balance sheet stabilization, 556; capital price adjustment method, 564–566; common dollar reporting, 566; concept of capital, 549–551; concept of income, 554–555; definition of technique, 548; depreciation, 551–552; objections to, 561–563; origin, 547–548; special capital reserve method, 570–571; summary, 571; technique of, 555–561; three-part income statements, 566–570
Stated value: 52; dollar amount, 52
State law: no-par stock, 52

Statement of cash receipts and disbursements, 64–65
Statement of surplus, 140–144
Statements: effect of inflation on, 547–548
Statistics as to treasury stock on balance sheet: American Institute of Accountants, 76
Statistics on charges and credits to surplus, 443–448
Status and liability of owners: business trusts, 13; joint stock companies, 12–13; mining partnership, 12; ordinary partnership, 11; partnership association members, 12–13; private business corporations, 13–14; statutory limited partnerships, 12; summary of, 11–15
Statutory limited partnerships: Arizona, 4; concept of legal entity of, 17; Florida, 4; formation of, 4; limited partner, or partners, in, 8; provision by state law of, 4–5; recognition by law of, 4
Stock certificates: accounting aspects of, 42–43; state requirements, 42–43; transfer of, 43
Stock dividend notice to shareholders, 200–202
Stock dividends: date taxable, 249; fractional shares, 247; issuer's entries for, 196–202; nontaxable and taxable, 245–247; receipt of, 247; reversal of, 202
Stock forfeiture, 48–51
Stockholders: liability of, 14; subscriptions, 14–15
Stock options: employee, 65, 489–494
Stock purchase warrants: definition, 255; illustration, 256; methods for issue of, 255; values of, 255
Stock rights: accounting for, 253; basis for, 250; dates of, 251; definition of, 251; formulas concerning parity value of, 252; investor's entries for, 252–255; nature of, 250; parity value, 251–252; pre-emptive right, 250; Revenue Act of 1939, 252
Stock split, 198
Subscription liability: fully paid, 14; uncollected asset theory, 15
Subscriptions to capital stock: pre-incorporation, 41
Subsidiaries: foreign, 535–546
Summary: appreciation and devaluation, 369–371; legal capital, 37–38; stabilized accounting, 571; status and liability of owners, 11–15; unusual gains and losses, 437–438
Surplus: appropriated and unappropriated, 110; availability for dividends, 109; classes of, 108–110; donations from stockholders, 125; general, 108; nature of, 107–108; paid-in surplus account, 108; recapitalization, 32; reconciliation of reported profits and, 129–132; résumé of classifications of, 123; revaluation surplus account, 108; segregated as to realization, 109; segregated as to source, 108–109; unrealized gross profit on installment sales account, 109
Surplus deduction theory of treasury stock: advantages of, 74
Surplus is capital, 107

Taxation of dividends: 241–245; earnings and profits, 241–242; general, 241–245; Treasury Department rulings on, 244–245
Tax-free exchange, 386
Terminology of income statement, 396–397
Three-part income statements, 566–570
Time factor, 404
Timely notices: corporate stock subscription, 41
Timing of equity adjustment, 78–79
Total contract price, 478
Total gross profit, 479
Treasury Department: income from accretion, 408
Treasury stock: accounting for, 70; classification of, 73; definition of, 70; distinguishing contributed capital by classes of stock, 79–81; dividend rights, 72; donated, 91–93; English rule, 70–71; general, 70; how purchased, 70; journalization of, 77–91; legal status, 70–73; offset theory, 74; overissue, 72; pre-emptive rights, 72; purchase of in relation to possible asset revaluation, 81; reacquisition of, 72–73; recording transfer of, 99; reissuable and nonreissuable shares, 81–86; right to sell, 72; rulings of American courts on purchase of, 71–72; sale below par, 72–73; sale of illegally acquired shares, 99; sale of shares purchased at several dates, 91; statutory restrictions on purchase of, 71; United States rule, 71–72; voting privilege, 72
Treasury stock acquired by forfeiture, 98–99
Treasury stock and capital stock retirement, 70–106
Treasury stock on balance sheet: aggregate

proprietary capital deduction theory, 75–76; asset theory, 73–74; offset theory, 74; statistics, 76–77; surplus deduction theory, 74–76
Treasury stock pledged as collateral, 99
Treasury stock transactions: exceptions to nongain or loss on, 78
True surplus reserves, 177
Trusts: business, 6; Massachusetts, 6

Unappropriated surplus, 110
Uncollected asset theory, 15
Underwriters' bids, 283
Underwriting costs: as organization costs, 68
Uniform Business Corporation Act, 183–184
Uniform Limited Partnership Act, 5
Uniform Partnership Act: meaning of association, 16
Unmatured bonds: illustration, 271–272; partial redemption of, 271–272
Unrealized gross profit on installment sales account, 467
Unrealized surplus reserves, 174–175; reserve for unrealized appreciation, 175
Unusual gains and losses: 431–441; American Institute of Accountants (Committee on Accounting Procedure), 438–441; American Institute of Accountants (Research Department), 435–436; methods of reporting, 433–437; Securities and Exchange Commission, *Regulation S–X*, 442–443

Valuation: leases, 314–315; real property, 326–350
Valuation-accrual reserves: 169–170; reserve for cash discounts on purchases, 170; reserve for cash discounts on sales, 170
Valuation-budgetary reserves: 159–169, 381–386; reserve for amortized appreciation in inventories, 167–168; reserve for amortized cost credit adjustments in inventories, 169; reserve for amortized cost debit adjustment in inventories, 168; reserve for amortized devaluation, 168–169; reserve for imputed interest on investment in inventories, 164–167; reserve for interdepartmental profit in inventories, 161–164; reserve for unrealized profit in branch inventory, 160–161
Value: stated, for no-par stock, 52
Voting privilege: treasury stock, 72

War emergency facilities: depreciation of, 380–381
Wasting asset industries, 182
When issued, 251
With dividends, 195
With rights, 251
Worksheets for correcting financial statements, 133–140