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ECONOMIC ASPECTS OF "LIBERALIZED DEPRECIATION"

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TABLE OF CONTENTS

	Page
LIST OF TABLES	vii
 Chapter	
I. INTRODUCTION.	1
II. EVOLUTION OF DEPRECIATION PRACTICE IN THE UNITED STATES	9
Concept of Depreciation in Early Economic and Accounting Writing	9
Economists.	9
Accountants	13
Revenue Act of 1913.	16
Treasury Decision 4422	16
Internal Revenue Code of 1939.	18
Case of United States Steel.	19
Internal Revenue Code of 1954.	22
Small Business Revision Act of 1958.	24
Certificates of Necessity.	25
World War I	26
World War II.	28
Korean War	30
Bulletin F	33
Description	33
Current Developments.	33
1962 Amendments.	34
Summary.	37
III. EMPIRICAL STUDIES CONCERNING THE USE OF "LIBERALIZED DEPRECIATION".	43
Financial Executives Research Foundation Study.	43
National Association of Accountants Study	48

Chapter	Page
III. (Continued)	
American Institute of Certified Public Accountants Studies	54
Machinery and Allied Products Institute Study.	54
Treasury Department Depreciation Survey	59
Summary	65
IV. IMPACT OF "LIBERALIZED DEPRECIATION" ON INVESTMENT DECISIONS	68
Time Discount Gain.	70
Availability of Financial Resources	78
Internal Financing	78
External Financing	83
Payback Period Analysis	83
Relationship of Depreciation to Rate of Return	87
Unadjusted Return Method	88
Discounted Cash Flow (Rate of Return Variant)	91
Discounted Cash Flow (Present- Worth Index Variant).	95
Small Business Revision Act of 1958	98
"Liberalized Depreciation," Capital Formation, and Economic Growth	99
Relationship of Capital Formation to Economic Growth.	100
Definition of capital formation	101
The Nurkse thesis	103
The Hirschman-Singer thesis	104
"Liberalized Depreciation as a Stimulus for Capital Formation.	105
Cash flow depreciation.	108
Current developments.	109
Summary	110
V. IMPACT OF "LIBERALIZED DEPRECIATION" ON MANAGERIAL DECISIONS	117
Product Pricing	119
Gross-Margin Pricing	121
Conversion Cost Pricing	124
Rate of Return Pricing	126
Flexible Mark-Up Pricing	128

Chapter	Page
V. (Continued)	
Dividend Policy	129
Dividend Stability	129
Restrictions of Retained Earnings.	131
Wage Negotiations	134
Criteria for Disclosure.	135
Reasonable requests	136
Unreasonable requests	137
The Independent Accountant	139
Analysis of Financial Statements.	142
Comparative Financial Statements	143
Allocation of Income Taxes	145
Depreciation and the Funds Statement	148
"Liberalized Depreciation" and the Cost Principle.	149
Summary	151
VI. SUMMARY AND CONCLUSIONS.	155
BIBLIOGRAPHY.	165

LIST OF TABLES

Table	Page
1. Depreciation Methods Used by 1302 Companies in the United States, 1960	45
2. Percentage Distribution of Depreciation Methods Used by 1302 Companies in the United States, 1960.	46
3. Responses, by Industry, of 1325 Companies in the United States to a Depreciation Survey, 1960	49
4. Depreciation Methods Used by 55 Companies in the United States for Income Tax Reporting, 1957.	51
5. Comparison of Depreciation Methods Used for Financial and Income Tax Reporting by 55 Companies in the United States, 1957	52
6. Depreciation Methods Reported by 88 Companies in the United States, 1960	55
7. Depreciation Methods Used by 296 Manu- facturing Companies in the United States for Income Tax Reporting, 1956.	57
8. Responses to Questions Dealing with Depreciation Policy from 259 to 281 Manufacturing Companies in the United States, 1956	58
9. Percentage Distribution of Depreciation Methods Used by 3,476 Companies in the United States for Income Tax Reporting, 1961.	61

Table	Page
10. Percentage Distribution of Depreciation Methods Used by 3,476 Companies in the United States for Financial and Income Tax Reporting, 1961	63
11. Percentage Distribution of Depreciation Methods Used by Companies Participating in Five Empirical Studies in the United States, 1956-1961	66
12. Calculation of the Present Value of Depreciation Deductions for Three Depreciation Methods.	71
13. Depreciation Charges Computed by Two Methods for an Asset Costing \$10,000, with Eight-Year Service Life, and 5 Per Cent Salvage Value.	75
14. Depreciation Charges Computed by Two Methods for an Asset Costing \$10,000, with Eight-Year Service Life, and Zero Salvage Value.	76
15. Depreciation Charges Computed by Two Methods for an Asset Costing \$10,000, with Four-Year Service Life, and Zero Salvage Value.	77
16. Illustration Showing Annual and Cumulative Differences in Depreciation Charges under Straight Line, Sum-of-the-Years Digits and Declining Balance Methods	80
17. Illustration of Payback Period Computation Using the Straight Line and Double Declining Balance Methods of Depreciation.	86
18. Illustration of Unadjusted Rate of Return Computation Using the Straight Line and Double Declining Balance Methods of Depreciation	89
19. Illustration of Discounted Cash Flow Rate of Return Variant Employing the Straight Line Method of Depreciation.	94

Table	Page
20. Illustration of Discounted Cash Flow Rate of Return Variant Employing the Declining Balance Method of Depreciation.	96
21. Illustration of Discounted Cash Flow Rate of Return Variant Employing the Sum of the Years-Digits Method of Depreciation	97
22. Relationship of Gross Private Domestic Investment to Gross National Product, Annually, 1952-1961	102
23. Relationship of Depreciation to Net Income for Ten Corporations in the United States, 1961	118
24. Comparison of Income Statements for a Trading Firm and a Manufacturing Firm . . .	123
25. Comparison of Manufacturing Costs for Two Products	125

ECONOMIC ASPECTS OF "LIBERALIZED DEPRECIATION"

CHAPTER I

INTRODUCTION

Depreciation is a subject that attracts considerable attention in our contemporary society. Ever since 1909 when the Supreme Court recognized depreciation as an expense of engaging in economic activity, it has been a topic of discussion in the literature of accountants, economists, and various government agencies.

For many business firms depreciation is a material operating expense. The typical firm has most of its investment in plant and equipment and/or inventory. It is necessary to record depreciation to account for the use of plant and equipment. Therefore, depreciation accounting is an important concern of management. Annual depreciation charges in the United States presently exceed \$40 billion.¹

The American Institute of Certified Public Accountants defines depreciation accounting as "a system of accounting which aims to distribute the cost (italics mine) 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."² Professor Joel Dean has written that "nobody can write an acceptable definition of depreciation."³ However, the above definition is acceptable to the Internal Revenue Service and is useful, therefore, for income tax reporting as well as for financial reporting, and will be used throughout this study. The study does not deal directly with the price level depreciation controversy.

Much of the discussion concerning depreciation has centered around the methodology of recording depreciation. With the exception of "certificates of necessity" the straight line method of recording depreciation was employed almost exclusively by business firms in the United States from 1909 to 1954. In 1954 there was a major change in the depreciation methods being authorized by the Internal Revenue Code of 1954. These methods were the "declining balance" method and the "sum of the years - digits" method.⁴ Since 1954 changes in depreciation policy have been moving in the direction of more liberal allowances.

The term "liberalized depreciation" is referred to throughout this study. The writer defines this term as embracing any method of accelerated depreciation whether in the form of "certificates of necessity" or one of the two accelerated methods cited above. Therefore, when the term is used in the study it connotes, in general, higher

depreciation charges than would be the case under straight line depreciation.

"Liberalized depreciation" may have different implications for the firm based on the size and organization of the firm. Most of the analysis of this study is relevant for both large firms and small firms, but major emphasis is devoted to the relationship of "liberalized depreciation" to firms with substantial investment in plant and equipment. Throughout most of the study the corporate form of business is assumed.

Since 1954 the literature has been replete with articles discussing "liberalized depreciation." There have also been several longer studies since 1954. Some of them have been in the form of theses and dissertations. Most of these articles and studies have dealt with the time discount gain that is provided to the firm by employing "liberalized depreciation" in the form of income tax savings. In this study the writer examines this feature of "liberalized depreciation" but the study is not restricted to this feature. The availability of "liberalized depreciation" may affect many managerial decisions such as investment, product pricing, and dividend policy. Also, there may be a relationship between "liberalized depreciation" and economic growth. These relationships, and others, are examined in this study.

The study begins by tracing the evolution of depreciation practices in the United States. In order to provide

a foundation for developments in the United States some early economic and accounting writings dealing with depreciation are reviewed briefly. Toward the turn of the twentieth century depreciation began to have significance in the United States. Major events in the formulation of depreciation policy from the early part of the century to the present time are examined in some detail. Particular emphasis is devoted to the development of "liberalized depreciation" practices. This section of the study closes with an examination of 1962 amendments to the internal revenue code which may affect depreciation practices in the future.

Chapter III of the study is devoted to an analysis of five empirical studies concerning the use of "liberalized depreciation" by business firms since 1954. The studies deal with depreciation practices for various industries. Of particular significance is the Treasury Department study which was conducted jointly by the Treasury Department and the Small Business Administration. The results of the studies are summarized at the end of the chapter.

The study next concerns itself with the relationship of "liberalized depreciation" to investment decisions of the firm. In this chapter the relationship of "liberalized depreciation" to contemporary quantitative methods that are available to management to assist in evaluating alternative investment proposals is examined. The contention that the benefits derived from employing "liberalized depreciation"

are lost in the long run is also examined in Chapter IV. The time discount gain feature of "liberalized depreciation" is illustrated by computing alternative present values for different depreciation methods. Payback period analysis is also presented in Chapter IV, along with different methods of computing rate of return, with particular emphasis on the relationship of "liberalized depreciation" to these traditional investment evaluation tools.

In evaluating the impact "liberalized depreciation" may have on managerial decisions, such as investment decisions, the writer assumes that quantitative analysis is employed by management to facilitate the decision making process. His analysis is based on quantitative considerations. However, the point is made that little is known about the weight management gives to non-quantitative factors such as intuition when making managerial decisions. In Chapter IV the relationship between "liberalized depreciation," capital formation, and economic growth is also examined.

In the last chapter the relationship of "liberalized depreciation" to managerial decisions other than investment decisions is examined. Specific managerial decisions examined in the chapter are product pricing, dividend policy, and wage negotiations. In the product pricing section of the chapter the development of micro economic price theories is reviewed. Using the cost plus pricing theory as a point of

departure, contemporary variations of cost plus pricing are examined to establish the relationship of "liberalized depreciation" to product pricing. Empirical studies dealing with dividend policy are cited in Chapter V. The relationship of dividend policy to earnings is examined. Since employing "liberalized depreciation" affects earnings the relationship between "liberalized depreciation" and dividend policy is examined. Employing "liberalized depreciation" minimizes income tax flows and makes more funds available for distribution in the form of cash dividends. An important consideration in wage negotiations is the firm's "ability to pay." Labor cases dealing with "ability to pay" are presented in Chapter V. Reference is made to the relationship of "liberalized depreciation" to profits which become the basis for the firm's "ability to pay."

In addition to examining the relationship of "liberalized depreciation" to the managerial decisions listed above, the writer also examines the impact of "liberalized depreciation" on the financial statements of the firm in Chapter V. A controversial problem that has arisen as a result of some firms employing "liberalized depreciation" for income tax reporting and straight line depreciation for financial reporting (income tax allocation) is examined briefly. Also, the relationship of "liberalized depreciation" to providing funds for replacement and expansion of plant and equipment is examined. The contention that recording depreciation in

itself provides for replacement of plant and equipment is analyzed in the chapter. Finally "liberalized depreciation" and the "cost principle" of accounting are discussed.

FOOTNOTES

¹The July, 1962 Survey of Current Business reports 1961 capital consumption allowances as 46.6 billion, of which approximately 90 per cent is depreciation.

²American Institute of Certified Public Accountants, Accounting Research and Terminology Bulletins (Final Edition: New York: American Institute of Certified Public Accountants, 1961), p. 21.

³Joel Dean, Tax Revision Compendium, Committee on Ways and Means, Volume II (Washington: U.S. Government Printing Office, 1959), p. 823.

⁴Comparisons of these two "liberalized depreciation" methods with the straight line method are presented in several tables in Chapter IV.

CHAPTER II

EVOLUTION OF DEPRECIATION PRACTICE IN THE UNITED STATES

Concept of Depreciation in Early Economic and Accounting Writings

Although there was probably some awareness of the phenomena of depreciation during the Middle Ages, it was during the period of early modern times that direct references to the concept began to appear in the literature.

Economists.--Before 1750 most people were engaged in activity associated with the land. Land and labor were considered to be the most important factors of production. Quesnay, and other physiocrats, "treated agriculture as the only truly productive occupation by virtue of the fact that it was the only one returning more to producers than their investment of capital and labor, actually yielding them a net income ('produit net') that represented the free contribution of nature."¹ The nonagricultural occupations were sterile because they did no more than return their costs, according to the physiocrats. This doctrine was an expression of the economic and social environment of the early eighteenth century.

Beginning in the 1750's there began to be a significant increase in agricultural production as a result of combining technology and capital. Entrepreneurship and capital began to be considered equally important factors of production. Large capital investments in improvements of agricultural land and implements contributed to raising the productivity of agriculture. Physiocrats began to emphasize the role of capital in their doctrines.²

J.B. Say, and others, have noted that the transition from labor to power driven machinery was a gradual process.³ They emphasize that inertia on the part of societies tended to make the introduction of machinery proceed at a slow pace. Reference is made to the considerable lag between the introduction of new machines and their use in the production process. By the nineteenth century, however, main trends of the Industrial Revolution became clearly established. As a result of the transition from labor to power-driven machinery capital was a dominant factor in industrial production.

From the time of Adam Smith to the present economists have placed great emphasis on the need for capital accumulation as a means of increasing output and improving living conditions. The interest in the accumulation and maintenance of capital necessitated a recognition of the limited durability of capital, which involves recognition of the concept of depreciation. Adam Smith alluded to the concept of depreciation in the "Wealth of Nations" when discussing the

accumulation and diminution of capital.⁴ A generation later David Ricardo wrote:

In every society the capital which is employed in production, is necessarily of limited durability. The food and clothing consumed by the labourer, the buildings in which he works, the implements with which his labor is assisted, are all of a perishable nature. There is however a vast difference in the time for which these different capitals will endure: a steam engine will last longer than a ship, a ship than the clothing of the labourer, and the clothing of the labourer longer than the food which he consumes.⁵

To facilitate a distinction between useful lives of capital Ricardo formulated his dichotomy of fixed and circulating capital. Ricardo defined circulating capital as capital that is rapidly perishable and requires frequent replenishing. Ricardo defined capital that is durable and does not have to be replenished frequently as fixed capital. In contemporary terminology circulating capital could be designated working capital, and fixed capital could be designated plant and equipment.

Another early economist, Nassau Senior, recognized the concept of depreciation when he converted the labor theory of value into a cost of production theory of value. By making capital a factor of production the concept of replacement of long-lasting equipment was suggested. There was a need to maintain the productivity of capital. In contemporary terminology, there was a need for recording depreciation.

John Stuart Mill devoted a chapter in his Principles of Political Economy to a discussion of the distinction

between fixed and circulating capital.⁶ He recognized the need for maintaining fixed capital intact. To use his words, "they (implements and buildings) require, at intervals, partial renewal by means of repairs, and are at last entirely worn out, and cannot be of any service as buildings and implements."⁷ Mill also recognized that fixed capital should provide a rate of return to its owner when he observed, "The machine answers the purpose of its owner if it brings in, during each interval of time, enough to cover the expense of repairs, and the deterioration in value which the machine has sustained during the same time, with a surplus sufficient to yield the ordinary profit on the entire value of the machine."⁸

Writing toward the end of the nineteenth century Alfred Marshall also recognized the concept of depreciation.⁹ He suggested the term consumption capital in lieu of circulating capital and auxiliary or instrumental, capital in lieu of fixed capital. Marshall emphasized the transition to a social view of capital as opposed to an individual view.

Until the end of the nineteenth century economists in general were not specifically concerned with formulae for various methods of depreciating capital assets. During the twentieth century depreciation methodology has become a topic of discussion in economic literature. Particularly since 1954 economists have had more and more to say about the concept of depreciation. For example, in his Economic Issues

of the 1960's Alvin Hansen discusses depreciation in several places. Professor Hansen appears to be particularly impressed with the possibilities of "counter-cyclical accelerated depreciation."¹⁰ Additional contemporary references to depreciation by economists will be noted later in this study.

Accountants.--A proprietor's view of depreciation is referred to in several early bookkeeping textbooks. In 1588 a text by John Mellis reflected the following entry on the debit side of the profit-and-loss account:

More XI Xs. for so much lost by decay householde
stuff as in Creditor (06)...10 10 0¹¹

Seventeenth century depreciation practices may be illustrated by the following example taken from a bookkeeping text written in 1683 by Stephen Monteage:

On the debit side of the loss-and-gain account is the entry: "To Horses impaired by a year's use -6: -: -." On another page the account for cows shows an opening price of 4 each, a later purchase at 5s. 11d. each and a balance remaining which is priced at 4s. 5d. each. This inventory price is slightly above the price at the opening but below an average price. So it would seem that the closing price was probably made somewhat higher by reason of the most recent purchase and yet low enough to represent a reduction in value for the animals owned throughout the year. In the sheep account, however, the balance (inventory) was priced at the same figure as at the opening of the account. Perhaps sheep, not being service animals, were not considered as having any "loss by use."¹²

Eighteenth century depreciation practices may be illustrated by John Mair's Bookkeeping Methodiz'd (5th edition, 1757):

Accounts of ships, houses, or other possessions . .
contain, upon the Dr. side, what they cost at first,

or are valued at, with all charges, such as repairs, or other expenses laid out upon them. The Cr. side contains, (if any thing be writ upon it), either what they are sold or exchanged for, or the profits arising from them; such as, freight, rent, etc. Here there are three cases. 1st, If nothing be written upon the Cr. side, it is closed, by being credited by Balance. 2dly, If the Cr. side be filled up, with the price of the ship, house, etc. sold, or otherwise disposed of, then the difference of the sides is the gain or loss made upon the sale; and the accompt is closed, by being debited or credited to or by Profit and Loss. 3dly, If the Cr. side contain only the freight or rent; in this case first charge the ship, house, etc. Dr. to Profit and Loss, for the freight or rent; and then close the accompt with Balance.¹³

By the nineteenth century the recognition of depreciation by the inventory method was widely suggested in accounting literature. The railroad movement in the United States during the nineteenth century created a need for the refinement of depreciation concepts. It was during the railroad era that management began to become aware of the relationship of depreciation to net income. In 1841, for example, the Americans Railroad Journal "reproduced an article 'from the English Railway Magazine' in which emphasis is given to the necessity for carefully and periodically ascertaining 'the precise comparative degree of wear and tear' so that only bona-fide net income would be apportioned to stockholders."¹⁴

The real impetus for improvements in depreciation accounting emerged with the growth of corporations in the early part of the twentieth century. The growth of corporations with diverse ownership and limited liability created additional needs for more meaningful calculations of net

profit. Also, the emergence of the corporation meant additional investment in capital equipment with long useful lives. These two factors--the need for a more meaningful measure of net profit and the use of capital equipment with long useful lives provided the basis for the development of depreciation accounting as we know it today.

In 1909 the Supreme Court recognized depreciation as an operating expense. In rendering a decision in City of Knoxville vs. Knoxville Water Company the Court held that the Knoxville Water Company was entitled to consider depreciation in the determination of net income. The rate of return should be computed after deducting depreciation according to the majority opinion of the Court. In writing the opinion the Court observed:

A water plant, with all its additions, begins to depreciate in value from the moment of its use. Before coming to the question of profit at all the company is entitled to earn a sufficient sum annually to provide not only for current repairs but for making good the depreciation and replacing the parts of the property when they come to the end of their life. The company is not bound to see its property gradually waste, without making provision out of earnings for its replacement. It is entitled to see that from earnings its value of the property invested is kept unimpaired, so that at the end of any given term of years the original investment remains as it was at the beginning.¹⁵

The emergence of the income tax as an important source of revenue in the United States and the consequent need for a clear concept of income contributed to the significance of the concept of depreciation.

Revenue Act of 1913

The sixteenth amendment to the Constitution of the United States gave Congress the power to levy and collect taxes on income from whatever source derived. The Revenue Act of 1913 referred briefly to the concept of depreciation.

The section of the Act dealing with business expenses stipulated that "a reasonable allowance for the exhaustion, wear and tear of property arising out of its use or employment in the business"¹⁶ could be made in determining taxable income. In essence, the Revenue Act of 1913 placed a stamp of approval on the position of the supreme court as cited in the Knoxville Water Company case. Under the depreciation provision of the Act of 1913 industry was allowed a large degree of discretion as to what constituted a reasonable allowance for wear and tear. The position of the Treasury concerning depreciation remained virtually unchanged until 1934. There seemed to be a tacit recognition that tax advantages gained by high depreciation allowances in the early years of an asset's life would be adjusted by the exhaustion of depreciation allowances in later years.

Treasury Decision 4422

As noted above, the concept of depreciation created little controversy before 1934. By 1934, however, the great depression was at its peak. Government found itself in the position of reviewing possible ways to generate an increase in the flow of revenue in order to finance various public

works programs. The Committee on Ways and Means proposed that all depreciation deductions be reduced 25 per cent for the years 1934 through 1936. Immediately, the Treasury Department entered the picture by challenging the constitutionality of the 25 per cent proposal. The Treasury expressed the view that the money should be raised administratively. The Treasury plan, which was quickly adopted, was expressed in the widely quoted Treasury Decision 4422. The decision read:

The capital sum to be recovered shall be charged off over the useful life of the property, either in equal annual installments or in accordance with any other recognized trade practice, such as an apportionment of the capital sum over units of production. Whatever plan or method of apportionment is adopted must be reasonable and must have due regard to operating conditions during the taxable period. The reasonableness of any claim for depreciation shall be determined upon the conditions known to exist at the end of the period for which the return is made. Where the cost or other basis of the property has been recovered through depreciation or other allowances no further deduction for depreciation shall be allowed. The deduction for depreciation in respect of any depreciable property for any taxable year shall be limited to such ratable amount as may reasonably be considered necessary to recover during the remaining useful life of the property the unrecovered cost or other basis. The burden of proof will rest upon the taxpayer to sustain the depreciation claimed. (italics mine). Therefore, taxpayers must furnish full and complete information with respect to the cost or other basis of the assets in respect of which depreciation is claimed, their age, condition and remaining useful life, the portion of their cost or other basis which has been recovered through depreciation allowances for prior taxable years, and such other information as the Commissioner may require in substantiation of the deduction claimed.¹⁷

The effect of this decision was to place the taxpayer on the defensive. To be sure the various collectors (later

changed to Directors) of Internal Revenue followed the intent of Treasury Decision 4422 the then Commissioner of Internal Revenue, Mr. Guy T. Helvering, initiated a directive which explained in detail the information that would be required to support depreciation deductions. The directive stated that all schedules and other data deemed necessary should be prepared by the tax payer, not by the examining officer.

As one scholar observed when appearing before the Committee on Ways and Means in 1959, "T. D. 4422 was a revenue-raising measure pure and simple. . . . It was not depreciation policy for economic growth but a tax collection measure to finance a short range welfare program in a depression. It has controlled the thinking of nearly every engineer agent for the last 25 years."¹⁸

Internal Revenue Code of 1939

The first major codification of the Internal Revenue Acts occurred in 1939. The definition of depreciation as expressed in the 1939 Internal Revenue Code was expanded to allow for the concept of obsolescence. The section of the 1939 Code dealing with depreciation reads as follows:

Depreciation--A reasonable allowance for the exhaustion, wear and tear (including a reasonable allowance for obsolescence)-

- (1) of property used in the trade or business, or
- (2) of property held for the production of income.¹⁹

The phrasing and presentation of the reference to

obsolescence suggests that the Treasury held that the provision for obsolescence was added merely as a parenthetical afterthought. As noted in the previous section, Treasury Decision 4422 placed the burden of proof as to the reasonableness of depreciation on the taxpayer. It is, of course, much more difficult to quantify obsolescence than physical deterioration. Therefore, although the allowance for obsolescence granted under the 1939 Code was significant as to the new wording depreciation allowable remained virtually the same as under the Revenue Act of 1913.

The 1939 Internal Revenue Code permitted the use of the declining balance depreciation method at a rate not exceeding $1\frac{1}{2}$ times the straight line rate. The method was not used much, however, due to the limitation imposed on the maximum rate allowable. Revenue Ruling 57-352, dated August 5, 1957, held that the 1939 provision could be applied to used property, as well as new, that was acquired after December 31, 1953. As will be mentioned in a later section of the chapter, the 1954 Code depreciation provisions apply only to new property acquired after December 31, 1953.

Case of United States Steel

During the 1940's one industrial giant formally held that depreciation as conventionally computed was too low.²⁰ Executives of U.S. Steel believed that depreciation allowable under the 1939 Revenue Code, as amended, did not provide sufficiently for replacement of plant and equipment. The abrupt

upturn of prices in 1946 and 1947 as a result of the relaxation of most government price controls added to the problem of providing for the replacement of antiquated facilities. Executives of U.S. Steel proposed immediate action to cope with the problem. In computing net income in 1947 the company included a sum of \$26,300,000 over and above the regular depreciation charge. In its annual report for 1947 U.S. Steel disclosed the additional depreciation and suggested that in their opinion the extra charge should be acceptable by members of the accounting profession and the Treasury Department. The additional charge was reflected on the company's income statement as a separate item and referred to as being added to cover replacement costs of properties.

As would be expected the company's independent auditors took exception to the additional allowance for depreciation. Professional accountants and economists were unable to agree on the need for additional depreciation allowance above historical cost. While testifying before the Joint Committee on the Economic Report of the President December 6, 1958, Sumner H. Slichter supported the position of U.S. Steel. He referred to the need for providing for replacement of facilities and observed that if a firm distributed all its profits in dividends and wages it is, in effect, depleting its capital. Carman G. Blough, director of research of the American Institute of Certified Public Accountants, recognized the need of providing for replacement

of productive facilities. However, he held that depreciation charges should be based on historical cost. His position was as follows:

There can be no argument but that a going concern must be able to replace its productive assets as they are used up if it is to continue to do business. It is also important for management to understand that the difference between cost and estimated replacement value may be significant in determining production and pricing policies. It does not follow, however, that the excess of cost of replacement over the cost of existing assets should be accounted for as current charges to income. All who have dealt with appraisal values know how very difficult it is just to determine replacement costs, but the most striking difficulty in this respect is the impossibility of predicting what will be the eventual cost of replacing a productive asset. How many men are prepared to state what the price level will be two years from today, to say nothing of trying to guess what it will be five or ten years hence when many of these assets are to be replaced?²¹

The Securities and Exchange Commission supported the position of the American Institute of Certified Public Accountants by expressing the opinion that depreciation should continue to be based upon cost.

During the first three quarters of 1948 U.S. Steel continued to charge depreciation in excess of cost. In fact, the company increased the rate of charge over the rate recorded in 1947. By the end of 1948, however, U.S. Steel announced that it was abandoning the policy adopted in 1947 of charging depreciation in excess of cost. It appeared, therefore, that the company was reverting to the position of the American Institute and the Securities and Exchange Commission. However, in an attempt to continue some provision to

provide for replacement of facilities U.S. Steel adopted a method of accelerated depreciation in 1948 which they made retroactive to January 1, 1947. The company noted that although accelerated depreciation was not deductible for federal income tax purposes at that time, the accelerated method was based on historical cost. The company's independent auditors were receptive to this change and U.S. Steel continued this policy through 1952. From 1952 to 1954 the company apparently did not use accelerated depreciation except on assets it owned that were being depreciated under "Certificates of Necessity," (referred to in a later section). Before examining the depreciation provisions of the 1954 Code the writer observes that the position of the American Institute of Certified Public Accountants concerning depreciation has remained the same as expressed by Carmen G. Blough in 1947.

Internal Revenue Code of 1954

There was a major change in depreciation policy for federal income tax reporting in 1954. The Internal Revenue Code of that year specifically authorized the use of two "liberalized depreciation" methods in addition to the traditional straight line method. Section 167 of the 1954 Code sets forth depreciation allowable as follows:

- (a) General Rule.--There shall be allowed as a depreciation deduction a reasonable allowance for the exhaustion, wear and tear (including a reasonable allowance for obsolescence)--

- (1) of property used in the trade or business or
- (2) of property held for the production of income.

(b) Use of Certain Methods and Rates.--For taxable years ending after December 31, 1953, the term "reasonable allowance" as used in subsection (a) shall include (but shall not be limited to) an allowance computed in accordance with regulations prescribed by the Secretary or his delegate, under any of the following methods:

- (1) the straight line method.

- (2) the declining balance method, using a rate not exceeding twice the rate which would have been used had the annual allowance been computed under the method described in paragraph (1),

- (3) the sum of the years-digits method, and

- (4) any other consistent method productive of an annual allowance which, when added to all allowances for the period commencing with the taxpayer's use of the property and including the taxable year, does not, during the first two-thirds of the useful life of the property, exceed the total of such allowance which would have been used had such allowances been computed under the method described in paragraph (2).

Nothing in this section shall be construed to limit or reduce an allowance otherwise allowable under subsection (a).²²

The remainder of section 167 of the 1954 Code stipulates limitations on the use of the accelerated methods. Most significant are the stipulations that assets must be new and have useful lives of at least three years.

Economists and accountants have contributed many articles appraising the new accelerated methods available to taxpayers under the Internal Revenue Code of 1954. Even at this date (1963) economists are unable to agree on the prevalence and economic effect of the "liberalized depreciation" methods.

Although the 1954 depreciation provisions again referred to the obsolescence factor, internal revenue agents continued to largely disregard this factor when making a decision as to the reasonableness of depreciation claimed by the taxpayer. In addition, the 1954 provisions did not provide for shortening the useful lives of assets. The life over which the total writeoff should occur was not changed. It appears, therefore, that the effect of Treasury Decision 4422 was not mitigated to any salient degree by the depreciation provisions of the 1954 Internal Revenue Code.

Small Business Revision Act of 1958

In 1958, Section 179 of the Internal Revenue Code of 1954 was amended to provide an initial depreciation allowance. This allowance was in addition to the methods previously allowed under the 1954 Code. The provision applies to property bought after 1957, but only for tax years ending after June, 1958. The additional allowance pertains only to tangible personal property (excluding buildings) that has a useful life of at least six years. In contrast to the accelerated methods allowed in the 1954 Code this provision embraces both new and used property. The additional allowance is 20 per cent for the first \$10,000 of cost for a single taxpayer, 20 per cent of the first \$20,000 of cost for a taxpayer filing a joint return, and 20 per cent of the first \$10,000 of cost for a corporation. The 20 per cent additional allowance may be taken for a full year even if

the purchase occurs after the first of the year. Also, in computing the new initial allowance salvage values may be disregarded.

The advantage of this provision to the larger purchaser of property is minor. In discussing the impact of this provision the Machinery and Allied Products Institute observed that "the provision of an initial writeoff represents an interesting and promising innovation in the American tax system. . . . This is true more because of the potential significance of this device than because of its importance as presently restricted."²³ Others hold that the initial writeoff change was merely a relief provision, not a stimulus. According to Mr. Edward F. Denison, probably the chief impact is a foot in the door impact.²⁴ Once the extra \$2,000 (20 per cent of \$10,000) is allowed it may be possible to raise it. As of this date, however, the initial writeoff provision has not been changed.

Certificates of Necessity

The only important legislative departure from the depreciation policy set forth above was the adoption of provisions for accelerated amortization of defense facilities.

David Thomas writes:

As an inducement to expand emergency capacity, no other incentive has been as effective as the income tax provision for the accelerated amortization of emergency facilities. And few legislative actions have evoked such widespread controversy. Its history in two World Wars and in the present defense era may be characterized

by a course including enactment, intensive utilization, keen scrutiny by the press, and investigation by Congress.²⁵

World War I.--The initial income tax provisions for accelerated amortization were embodied in the Revenue Acts of 1918 and 1921. Provisions of these acts provided a tax allowance for the years 1918 through 1923 in recognition of the absorption of the value of facilities in the production of articles contributing to war efforts against the Central Powers. The Bureau of Internal Revenue was assigned the task of administering the accelerated amortization provisions. In the administration of the laws an attempt was made to arrive at actual economic obsolescence that occurred during the emergency period.

The Act of 1918 was not passed until after the war. Therefore, determination of the total costs which could be written off at an accelerated rate was an ex-post decision. Managers of business firms who increased their capacity for emergency purposes knew there would be a tax concession of some type, but they didn't know the extent of the concession. In 1923 the Bureau of Internal Revenue appraised emergency facilities which were still in the possession of the original owners in order to determine the total costs which could be amortized. The difference between the original cost of a facility and its appraised value was designated as the cost absorbed for war purposes. In the case of facilities sold the selling price was employed in determining the expiration

of cost as a result of engaging in the production of war materials. In appraising facilities still in the possession of the taxpayer the primary basis for the appraisal value was the revenue-producing potential of the facilities. However, the appraisal value could not be less than the assets salvage or sale value and could not be more than the current replacement cost.

By 1926 it was obvious that the Bureau of Internal Revenue had made many errors in estimating the postwar use of the emergency facilities. As a result, a Senate Committee engaged in an extensive investigation of the Bureau's estimates. They concluded that about 50 per cent of the total accelerated amortization allowances approved by the Bureau were excessive. The committee noted that in some cases facilities that were considered to be without value, thereby being approved for total writeoffs, were used by the companies again beginning in 1923. As a result of their findings the Senate committee recommended that retroactive adjustments be made which would allow accelerated amortization only on facilities sold or scrapped after the emergency period. The committee recommendations were not followed.

There were administrative problems connected with the accelerated amortization provisions immediately following World War I. Nevertheless, the Act of 1918 was an attempt to arrive at actual economic cost expiration. It appears, therefore, that the shortcoming should be attributed to the

administration of the provisions of the Act, not to the Act itself.

World War II.--In 1940 the provision for accelerated amortization once again became a topic of serious consideration. Congress became deeply concerned with formulating an effective incentive to stimulate investment by private industry. Congress was aware of the delay connected with the belated determination of allowable accelerated amortization during World War I. They realized that the country could not afford a restraining influence on expansion for war production. It was apparent that industry would demand advance knowledge concerning the degree of tax concession connected with emergency expansion.

Borrowing from their World War I experience Congress incorporated an accelerated amortization provision into the Second Revenue Act of 1940. This provision, which became Section 124 of the Internal Revenue Code, provided for obtaining "Certificates of Necessity" from the Army or Navy. Taxpayers receiving these certificates were allowed to write-off the cost of facilities certified over a period of 60 months. Section 124 of the Code also stipulated that a shorter period than 60 months could be used if the national emergency did not last that long.

The 1940 Act provided for a Nonreimbursement Certificate to assist in administering provisions of the Act. The Nonreimbursement Certificate certified that a contractor had

not included depreciation above the normal rate (i.e. accelerated depreciation) in the determination of product pricing. Many government contracts are formulated on a cost plus basis. Depreciation may constitute a substantial portion of product cost. Therefore, the depreciation method used by a firm would have an effect on product pricing. Employing accelerated depreciation would make product cost, and therefore product pricing, higher than would straight line depreciation.

Administration of the Nonreimbursement Certificates was cumbersome. Also, the red tape was thought to be a deterrent to private investment in emergency facilities. Therefore, their use was gradually discontinued. Even after the certificate issuance was discontinued, however, government auditors continued to follow a policy of disallowing the inclusion of accelerated amortization in the determination of product cost. Largely to clarify the position of government concerning the "Certificates of Necessity" the Renegotiation Act of 1943 was passed by Congress. This act provided that accelerated amortization could be considered an element of product cost in renegotiation proceedings. Since many contracts were renegotiated the Act, in effect, reversed the position exemplified by the issuance of Nonreimbursement Certificates.

The accelerated amortization provisions of Section 124 of the Internal Revenue Code were more liberal than the

World War I provisions. The five year writeoff was not designed to measure the economic cost of producing war materials as the Revenue Acts of 1918 and 1923 did. The main concern in 1940, as implied in the Second Revenue Act of 1940, was one of establishing a tax concession to effect the necessary expansion of facilities. The selection of a 60 month writeoff period was arbitrary. Also, the fact that profits from the sale of fully amortized emergency facilities were subject to capital gains provisions contributed to an increase in requests for "Certificates of Necessity" during World War II.

Korean War.--As international tension increased in 1950 the feasibility of allowing accelerated amortization for emergency facilities was again discussed. After a short appraisal period, Section 124A of the Internal Revenue Code, which authorized accelerated amortization, was incorporated into the Revenue Act of 1950. The accelerated amortization provisions of the Revenue Act of 1950 followed the pattern developed during World War II.

Provisions of the 1950 statute were different from the provisions of the Revenue Act of 1940 in the following respects:

- (1) Authorizations for certificates for less than 100 per cent of the cost of a facility were to be granted.
- (2) The amortization period was to be five years but no provision was incorporated in the law for writing off any unamortized portion of the cost of the new

facilities in the event that the emergency was terminated in less than five years or that the assets in question were found no longer essential for national defense.

(3) Gains from the sale of the facilities were to be taxed at the rate applicable to ordinary income for the amount in excess of the gain which would have been realized if normal depreciation had been used.²⁶

Administrative problems under the Revenue Act of 1950 were much the same as in the Second Revenue Act of 1940. The product price aspect of accelerated amortization was never actually resolved during World War II. Consequently, during the Korean War there was much disagreement as to the relationship between accelerated amortization and defense product cost.

The Renegotiation Act of 1951 attempted to clarify this reoccurring issue by providing that all items of cost that were deductible for federal income tax reporting could be allowed as items of cost in contracts with the Department of Defense. Section 124A of the Internal Revenue Code provided for accelerated amortization; therefore, it was considered allowable as an item of product cost.

Disagreement among the Treasury Department, the Office of Defense Mobilization, and the Renegotiation Board concerning the cost issue continued throughout 1951. In late 1951 and early 1952 the Office of Defense Mobilization, under the direction of Charles E. Wilson, reviewed the problem. In July, 1952 new rules governing the inclusion of accelerated amortization as an element of product cost were

promulgated. Since that time the cost issue has been fairly well agreed upon. From July, 1952 until 1960 accelerated amortization was allowable for tax purposes and renegotiation but not allowable in original price negotiation. For "Certificates of Necessity" issued prior to August 23, 1957 only the part of the cost of facilities which the certifying agency certified as necessary to contribute to national defense were subject to the rapid writeoff provisions. Certificates issued subsequent to August 22, 1957 were limited to a narrow category of defense and defense-associated facilities. On December 31, 1959 statutory authorization for further issuance of "Certificates of Necessity" expired.

Much literature has been devoted to an appraisal of accelerated amortization of emergency facilities. Probably the most complete analysis of this subject is presented in the work of David Thomas.²⁵

The following observations concerning "Certificates of Necessity" were made in the Survey of Current Business in May, 1951:

Several important qualifications should be emphasized in evaluating the revenue 'cost' aspect of the amortization program. . . . in the absence of this program, alternative methods of financing some of the required facilities, including possibly direct Federal outlays, would undoubtedly be necessary. . . . In general it must be recognized that a full evaluation of the rapid amortization program can only be made in the light of the general environment in which the plan operates rather than by considering separate aspects of the program in isolation.²⁷

Bulletin F

Description.--It will be recalled that in 1934 Treasury Decision 4422 placed the burden of proof of the reasonableness of depreciation claimed on the taxpayer. The Treasury position was amplified considerably in 1942 by the publication of Bulletin F. This Bulletin purported to list, for each industry, average useful lives for various assets. As mentioned earlier, it is most difficult, if not impossible, to meet the burden of proof test required under Treasury Decision 4422. For all practical purposes, therefore, Bulletin F became the guiding light for internal revenue agents. As a result of the promulgation of Bulletin F, depreciation audits conducted by revenue agents became, for the most part, an audit based on the use of mortality tables.

There was some indication of a trend to reduce the burden imposed by Treasury Decision 4422 and Bulletin F in the 1950's. "Certificates of Necessity" were issued in 1950 under the Revenue Act of 1950 as previously discussed. Also, "liberalized depreciation" methods were given official sanction in the 1954 Internal Revenue Code. Nevertheless, the Bulletin F concept of listed useful lives precluded any real change in depreciation policy. Internal revenue agents continued to be oblivious to the obsolescence factor which was becoming more and more significant in the 1950's.

Current Developments.--In July, 1962 the Treasury Department issued Revenue Procedure 62-21, Depreciation

Guidelines and Rules, which formally rendered Bulletin F obsolete. The new guidelines are applicable to all depreciable property, including existing as well as new property.

At the time of the release of the new guidelines Secretary of the Treasury, Douglas Dillon, commented as follows:

The new guideline lives average 32 percent shorter than those established in Bulletin F. More significant, they are--as our Treasury depreciation survey showed--15 percent shorter than the lives in actual use by 1,100 large corporations which hold two-thirds of all the depreciable assets in manufacturing. . . . More rapid depreciation than presently taken will be immediately allowed under the new guidelines on 70 to 80 percent of the assets in use by American business today.

For all of our 12 million corporate and noncorporate businesses, we estimate that the potential increase in annual depreciation charges under the new guidelines will amount to 17 percent, or a total of \$4.7 billion, in the first year.²⁸

Revenue Procedure 62-21 is divided into three parts. Part I contains the new guidelines which consist of new classes and new useful lives. Part II describes the procedures that will be followed by Internal Revenue agents when examining depreciation deductions. Part III illustrates reserve ratio tables and adjustment tables for class lives.

The promulgation of the new guidelines constitutes a major shift in policy towards allowing more liberal depreciation charges.

1962 Amendments

The 1962 amendments to the Internal Revenue Code of 1954 that pertain to depreciation center around the new

"recapture of depreciation" clause. The Internal Revenue Act of 1962 contains a "recapture of depreciation" clause which adds Section 1245 to the Internal Revenue Code of 1954.

In the past a taxpayer has been able to employ "liberalized depreciation" on depreciable property which might reduce the basis of the property below its fair market value. After recovering most of the cost of the property the taxpayer could sell the property and report the gain as a capital gain. This feature was particularly attractive to the taxpayer as it allowed the depreciation to offset income at full tax rates and allowed the gain on resale to be taxed at favorable capital gain rates.

The "recapture clause" of the Revenue Act of 1962 appears to be aimed at closing this tax savings device.

The new law applies to all depreciable property (other than livestock) with the major exception of buildings and their structural components. Gains from the sale of buildings and their structural components will still be capital gains. The definition of depreciable property also embraces intangibles such as patents.

In general, a gain on the sale of depreciable property up to its "recomputed basis" is Section 1245 ordinary income and the gain in excess of this is taxable as a capital gain under Section 1231 of the 1954 Internal Revenue Code. The "recomputed basis" is the adjusted basis (cost less accumulated depreciation) plus all depreciation attributable to

periods after 1961. In essence, if the sale of depreciable property results in a gain the depreciation claimed after 1961 is considered excessive. Therefore, the basis must be adjusted by the excessive depreciation to arrive at the "re-computed basis." An example of the application of the "re-capture clause" is presented below:

Assumption: Taxpayer operating on a calendar year basis sells depreciable property for \$20,000 on January 1, 1963. The depreciable property has an adjusted basis of \$15,000 at time of sale and the depreciation deduction for 1962 was \$3,000.

Determination of Total Gain:	
Sales Price	\$20,000
Adjusted Basis	<u>15,000</u>
Total Gain	<u>\$ 5,000</u>

Computation of Recomputed Basis:	
Adjusted Basis	\$15,000
Depreciation after 1961	<u>3,000</u>
Recomputed Basis	<u>\$18,000</u>

Allocation of Total Gain:	
Recomputed Basis	\$18,000
Adjusted Basis	<u>15,000</u>
Section 1245 Gain	<u>\$ 3,000</u>
Capital Gain	<u>2,000</u>
Total Gain	<u>\$ 5,000</u>

If the sale price is less than the recomputed basis, Section 1245 income (ordinary income) is limited to the actual gain. For example, if the taxpayer had received only \$17,000 for the depreciable property (instead of \$20,000) the recomputed basis would still be \$18,000, but the Section 1245 income would only be \$2,000, which would be the actual gain. There would be no capital gain in this case.

Since excessive depreciation will be recaptured on

disposition of the property, the Internal Revenue Act of 1962, which amends Sections 167, 170, 453, 613(a), and 751 of the 1954 Code (in addition to adding Section 1245), makes essentially two changes in depreciation policy. They are:

(1) For personal property (other than livestock) with a useful life of at least 3 years acquired after enactment, taxpayer may disregard salvage up to 10% of cost.

(2) Taxpayer may change without Revenue Service permission from any accelerated method of depreciating Section 1245 property to the straight-line method. Election must be made not later than the return date of the return for the first taxable year after 1962.²⁹

There appears to be a relationship between the promulgation of new depreciation guidelines (discussed in the previous section) and the "recapture clause" discussed above. This relationship is suggested by the following reference:

The prospect for the adoption of the recapture rule was at least in part the reason why the Treasury liberalized its depreciation policy last July. Any excessive depreciation taken by taxpayers under the new policy will be recaptured as ordinary income on sale of the asset. Inasmuch as the recapture rule does not apply to buildings and their components, the Treasury was unwilling to liberalize the depreciation policy as to such assets.³⁰

Summary

The evolution of depreciation policy in the United States may be divided into four periods; before 1913, 1913 to 1934, 1934 to 1954, and after 1954. Before 1913 there was little controversy concerning the concept of depreciation. References in economic and accounting literature on the subject, until the Revenue Act of 1913 specifically provided for depreciation as an allowable business expense, were

scarce. Perhaps the precedence for the 1913 depreciation provision was set in the Knoxville Water Company case of 1909.

1913 to 1934.--During this period taxpayers were allowed a large degree of discretion in the determination of the reasonableness of depreciation allowances. The major restriction was that depreciation allowances should be limited to historical cost. Depreciation claimed by the taxpayer was allowed unless the Bureau of Internal Revenue could convincingly show that the claim was unreasonable.

1934 to 1954.--Under pressure for increased federal revenue in 1934 the Treasury Department rendered Decision 4422. The burden of proof as to the reasonableness of depreciation allowances was shifted to industry. Since it is virtually impossible to quantify future physical deterioration, much less obsolescence, the effect of the Decision was to implement a policy of drastic cutbacks of depreciation allowances. The publication of Bulletin F in 1942 served to strengthen and prolong the policy initiated in 1934 under Treasury Decision 4422.

From 1934 to 1954 depreciation policy, although under constant attack by industry, closely adhered to the position established in Treasury Decision 4422 and Bulletin F. The only notable deviation from this policy was the issuance of certificates for accelerated amortization of emergency facilities under the Second Revenue Act of 1940 and the Revenue Act of 1950.

After 1954.--The Internal Revenue Code of 1954 authorized the use of two liberal depreciation methods; the declining balance method, and the sum of the years-digit method. Although the declining balance method was initially permitted under the 1939 Revenue Code, the rate allowable under the method was increased from $1\frac{1}{2}$ times the straight line rate to 2 times the straight line rate in 1954.

In 1958 industry was allowed an initial 20 per cent depreciation allowance in addition to normal depreciation. This provision contained a maximum allowance provision of \$2,000 causing it to be described as mainly a relief provision, not an investment stimulus.

In July, 1962 the Treasury Department promulgated Revenue Ruling 62-21 which established new depreciation guidelines. The new depreciation rates appear to be another move towards a more liberal depreciation policy on the part of the federal government. Under the new guidelines the average useful lives of depreciable property are approximately 32 per cent shorter than those established in Bulletin F.

Depreciation changes in the Revenue Act of 1962 center around the "recapture of depreciation" clause which converts capital gain income to ordinary income in cases where excessive depreciation is claimed by the taxpayer. The "recapture clause" adds Section 1245 to the Internal Revenue Code of 1954.

In the following chapter the use of "liberalized depreciation" since 1954 is examined.

FOOTNOTES

¹Paul Studenski, The Income of Nations (New York: New York University Press, 1958), p. 15.

²Ibid., p. 16.

³George E. Barnett, "Machinery and the Displacement of Skill," Quarterly Journal of Economics, Volume XL (1926), pp. 111-133.

⁴Adam Smith, The Wealth of Nations (New York: The Modern Library, 1937), p. 316.

⁵David Ricardo, On the Principles of Political Economy and Taxation (Gerogetown, D.C.: Joseph Milligan, 1819), p. 15.

⁶John Stuart Mill, Principles of Political Economy (New York: Longmans, Green and Co., 1929), chapter VI.

⁷Ibid., p. 92.

⁸Ibid., p. 94.

⁹Alfred Marshall, Principles of Economics, Eighth Edition (New York: The MacMillan Company, 1948), pp. 75-78.

¹⁰Alvin H. Hansen, Economic Issues of the 1960's (New York: McGraw-Hill Book Company, Inc., 1960), pp. 34-35.

¹¹A.C. Littleton, Accounting Evolution to 1900 (New York: American Institute Publishing Co., Inc., 1933), p. 223, (citing) John Mellis, A Briefe Instruction, 1588.

¹²Ibid., p. 224.

¹³Ibid., p. 225.

¹⁴Ibid., p. 227.

¹⁵U.S. Reports, Volume CCXII, October Term, 1908 (New York: Banks Law Publishing Co., 1909), p. 14.

¹⁶U.S. Statues at Large. XXVIII, Part 1, 167.

¹⁷U.S. Treasury Department, Internal Revenue Cumulative Bulletin XIII-1, January-June 1934, p. 58.

¹⁸Joel Barlow, Tax Revision Compendium, Committee on Ways and Means, Volume II (Washington: U.S. Government Printing Office, 1959), p. 831.

¹⁹U.S. Internal Revenue Code of 1939, Section 23(c) (1).

²⁰This section was developed primarily from a case study presented in "Management Accounting" by Robert N. Anthony (Illinois: Richard D. Irwin, Inc., 1960), p. 222.

²¹Carmen G. Blough, "Replacement and Excess Construction Costs," The Journal of Accountancy, Volume LXXXIV (October, 1947), p. 335.

²²U.S. Internal Revenue Code of 1954, Section 167(a) and (b).

²³Machinery and Allied Products Institute, Effect of the New Initial Writeoff on Business Investment, A Report Prepared by Machinery and Allied Products Institute (Washington 6, D.C., 1958), p. 3.

²⁴Interview with Edward F. Denison, Associate Director of Research, Committee for Economic Development, Washington 25, D.C., May 28, 1962.

²⁵David A. Thomas, Accelerated Amortization (Michigan Business Studies, Volume XIII, Number 4, 1958), p. 29.

²⁶Ibid., p. 42.

²⁷"Accelerated Amortization and Private Facilities Expansion," Survey of Current Business, May, 1951, p. 11.

²⁸U.S. Treasury Department, Depreciation Guidelines and Rules (Revenue Procedure 62-21) (Washington: U.S. Government Printing Office, July, 1962), p. 3.

²⁹Accountants Weekly Report, Concise Explanation of the New 1962 Tax Law (Revenue Act of 1962) (New Jersey: Prentice Hall, Inc., October 15, 1962), p. 20.

³⁰Ibid., p. 17.

CHAPTER III

EMPIRICAL STUDIES OF THE USE OF "LIBERALIZED DEPRECIATION"

Since 1954 industry has been permitted to adopt either of two "liberalized depreciation" methods for federal income tax reporting. Depreciation provisions of the 1954 Internal Revenue Code were presented in the previous chapter. There have been several studies concerning the use of the accelerated depreciation provisions of the 1954 Code, most of which consist of surveys conducted by industrial and governmental agencies. In this chapter five of these studies are examined.

Financial Executives Research Foundation Study

On April 20, 1960 the Financial Executives Research Foundation completed their final report on the results of a survey regarding the use of various depreciation methods.¹ The report is based on results of 1,325 questionnaires received from various companies that participated in the survey. To facilitate examining the results of the study, responses may be classified as follows:

Group A.--Respondents in this group used straight line depreciation exclusively. The straight line method was used for financial reporting and for income tax reporting.

Group B.--Respondents in this group used liberalized depreciation methods for all purposes, both for financial and income tax reporting.

Group C.--Respondents in this group used straight line depreciation for financial reporting and liberalized depreciation for tax reporting. Companies in this group indicated that they did not provide for deferred income taxes that might materialize as a result of using straight line depreciation for financial reporting and liberalized depreciation for income tax reporting.²

Group D.--Respondents in this group used straight line depreciation for financial reporting and liberalized depreciation for tax reporting as Group C did. However, companies in this group did provide for deferred income taxes that might materialize as a result of using straight line depreciation for financial reporting and liberalized depreciation for income tax reporting.

Group E.--A total of 23 respondents (about 2% of the total) were special cases due to peculiarities of their industry and, therefore, did not fall within one of the above groups. This group consists mainly of banks, public utilities, and insurance companies.

The results of the Finance Executive Institute study are summarized in Tables 1 and 2.

Seventy seven per cent of the responding companies in Group A-D use some method of "liberalized depreciation" and 23 per cent use the straight line method. Of the 999 employing "liberalized depreciation," 456 (46 per cent) use the declining balance method, 377 (38 per cent) use the sum of the years-digits method, and 166 (16 per cent) employ both methods. The declining balance method is the most popular with the companies that participated in the study.

TABLE 1

DEPRECIATION METHODS USED BY 1302 COMPANIES IN THE UNITED STATES, 1960

Method	Groups ¹				Total
	Liberalized Depreciation				
	A	B	C	D	
1. Straight Line	303				303
2. Declining Balance		330	38	88	456
3. Sum of Years-Digits		310	28	39	377
4. Combination of Methods 2. and 3.		92	23	51	166
Total	303	732	89	178	1302 ^a

¹For meaning of Groups A-D- see accompanying text.

^aThe total of groups A-D equals 1302. Group E consists of 23 respondents which brings the total to 1325. See accompanying text for significance of Group E and number 1325.

Source: Controllers Institute Research Foundation, What Depreciation, April 20, 1960, pp. 2-6.

TABLE 2
 PERCENTAGE DISTRIBUTION OF DEPRECIATION METHODS USED
 BY 1302 COMPANIES IN THE UNITED STATES, 1960

Method	Groups ¹			
	Liberalized Depreciation			
	A	B	C	D
1. Straight Line	100			
2. Declining Balance		45	43	49
3. Sum of Years-Digits		42	31	22
4. Combination of Methods 2. and 3.		13	26	29
Total	100	100	100	100

¹For meaning of Groups A-D- see accompanying text.

Source: Controllers Institute Research Foundation, What De-
 preciation, April 20, 1960, pp. 2-6.

Group B which uses "liberalized depreciation" for both financial and income tax reporting is the largest of the groups. The second most significant group is A which uses the straight line method for both financial and income tax reporting. These two groups constitute 78 per cent of the total respondents. Companies employing "liberalized depreciation" for tax purposes and straight line for financial reporting (Groups C and D) are in the minority.

Participating companies presented various reasons for the selection of different depreciation methods. Most of the respondents in Group A stated that there wasn't enough difference in the amount of depreciation allowable under the straight line and the liberalized methods to concern themselves with. Respondents in Group B, however, believe that the "liberalized depreciation" methods more nearly measure the decrease in earning power of facilities. Therefore, they used the liberalized methods for financial, as well as for income tax, reporting. Respondents in Group C generally expressed the belief that depreciation calculated by using the liberalized methods will never be less than straight line depreciation. They contend that the tax reduction will continue to accumulate indefinitely; therefore, they see no reason to provide for deferral of income taxes. Companies in Group D agree with companies in Group C in the selection of straight line depreciation for tax reporting and "liberalized depreciation" for financial reporting.

However, they contend that the tax reduction resulting from using "liberalized depreciation" for tax reporting will not accumulate indefinitely. Therefore, companies in Group D either provide for deferred income taxes or recognize the related tax effect as additional depreciation.

Industries surveyed in the Finance Executive Institute study may be classified by divisions in about the same manner that industries are classified in the Standard Industrial Classification Manual.³ This is reflected in Table 3.

Data in Table 3 attest to the careful selection of companies so as to make the survey results a representative sample of the universe. Proper weights seem to have been given to the various industries. Also, the data reveal that there does not seem to be a concentration of "liberalized depreciation" methods in particular industries.

National Association of Accountants Study

On April 1, 1958 the National Association of Accountants published Research Report 33, a study based on depreciation practices of 55 companies.⁴ The companies selected were ones that the Association thought would possibly reflect depreciation practice trends for the economy. Thirty of the participating companies were listed in the study; twenty five wished to remain anonymous. The following companies were among the 30 listed:

TABLE 3

RESPONSES, BY INDUSTRY, OF 1325 COMPANIES IN THE
UNITED STATES TO A DEPRECIATION SURVEY, 1960

Industry Divisions	Groups ¹					Total	Per cent of Total
	A	B	C	D	E		
Agriculture, Forestry, etc.	8	7	2	1	-	18	1
Mining	18	34	8	15	-	75	6
Construction	4	21	3	-	-	28	2
Manufacturing	171	541	44	112	2	870	65
Transportation, Communication, and Public Utilities	44	27	17	31	8	127	11
Wholesale and Retail	30	52	11	15	-	108	8
Finance, Insurance, and Real Estate	24	33	2	1	12	72	5
Services	4	17	2	3	1	27	2
Total	303	732	89	178	23	1325	100

¹For meaning of Groups A-E- see accompanying text.

Source: Controllers Institute Research Foundation, What Depreciation,
April 20, 1960, Table 1.

Allied Products Corporation
Chrysler Corporation
Detroit Harvester Company
Diamond Match Company
Dunlop Tire and Rubber Company
General Foods Company
International Shoe Company
Kaiser Aluminum and Chemical Company
Moore Business Forms, Incorporated
United States Steel Corporation

The study dealt primarily with major industrial firms. Fifty two of the participating companies used the straight line method both for financial and income tax reporting prior to 1954. Two of the companies used the units-of-output method and one used the declining balance method of $1\frac{1}{2}$ times the straight line rate.

Table 4 reflects changes in depreciation practice of the 55 companies as a result of the "liberalized depreciation" amendments to the Internal Revenue Code of 1954. The data in the table indicate that 3 out of 4 companies participating in the study employ one of the "liberalized depreciation" methods for income tax reporting. This is a significant change from the depreciation practices employed by the companies prior to 1954.

A comparison of depreciation practices for financial and income tax reporting is presented in Table 5. Most of the companies participating in this study (86 per cent) employ the same depreciation method for financial and income tax reporting. Therefore, these companies are not concerned with allocating deferred income taxes that might arise if the companies used "liberalized depreciation" for tax reporting

TABLE 4
 DEPRECIATION METHODS USED BY 55 COMPANIES IN THE UNITED STATES
 FOR INCOME TAX REPORTING, 1957.

<u>Method</u>	<u>Number</u>
Declining Balance and Sum of Years-Digits ¹	40
Straight Line	14
Other	1
Total	55

¹No distinction between the two methods was provided in the study.

Source: National Association of Accountants, Current Practice in Accounting for Depreciation, April 1, 1958, p. 6.

TABLE 5

COMPARISON OF DEPRECIATION METHODS USED FOR FINANCIAL AND INCOME
TAX REPORTING BY 55 COMPANIES IN THE UNITED STATES, 1957

<u>Comparison of Methods</u>	<u>Number</u>
Same Method Used for Financial and Income Tax Reporting	49
Different Methods Used	6
Total	55

Source: National Association of Accountants, Current
Practice in Accounting for Depreciation, April 1, 1958, p. 20.

and straight line depreciation for financial reporting. Apparently, these companies hold that either the amount of the tax deferral would not be material, or that the tax deferral would tend to be permanent due to continual expansion of facilities.

It is surprising that firms the size of the ones in this study follow the same rules for financial and tax reporting in so important an area as depreciation. Many small firms follow tax rules for financial accounting as a matter of expediency. However, procedural problems that are presented by employing different depreciation methods would not be as significant to large firms with competent accounting staffs.

Data presented in the National Accounting Association study imply that many large firms use "liberalized depreciation" for financial reporting. Table 4 indicates 73 per cent of the participating firms use "liberalized depreciation" for income tax reporting. Table 5 indicates 86 per cent of the firms use the same method for financial and income tax reporting. It follows that a substantial majority of the firms in the study employ "liberalized depreciation" for financial, as well as for income tax, reporting. Although only 55 companies participated in the study, it indicates that the 55 large ones do use "liberalized depreciation."

American Institute of Certified
Public Accountants Studies

In 1946 the American Institute of Certified Public Accountants (AICPA) initiated a program for the analysis of annual corporate financial reports. The program resulted in the publication of an annual edition of Accounting Trends and Techniques. Each annual edition surveys the accounting techniques and trends of 600 corporations. Significant accounting trends are presented in numerous comparative tabulations in the annual editions. Accounting techniques employed by the 600 survey companies are presented in the form of examples cited from annual financial reports of the companies.

In 1961 most of the companies in the survey were large ones.⁵ It is not possible to compare the depreciation methods used for financial and income tax reporting for all companies, because only 88 companies provided depreciation data. The data provided were based on financial reporting methods. Among these 88 companies about two-thirds of them used one or more of the "liberalized depreciation" methods. Depreciation methods employed by the 88 companies in 1960 are presented in Table 6.

Machinery and Allied Products
Institute Study

In 1956 the Machinery and Allied Products Institute (MAPI) conducted a survey dealing with replacement of facilities and depreciation policy.⁶ Questionnaires were

TABLE 6
 DEPRECIATION METHODS REPORTED BY 88 COMPANIES
 IN THE UNITED STATES, 1960

<u>Method</u>	<u>Number</u>
1. Declining Balance	10
2. Sum of Years-Digits	12
3. Combination of Methods 1. and 2.	32
4. Straight Line	25
5. Units of Production	<u>9</u>
Total	88

Source: American Institute of Certified Public Accountants, Accounting Trends and Techniques, 1961, pp. 164-165.

distributed to 491 companies engaged in the manufacture of capital equipment. About 60 per cent (296) of the questionnaires returned were sufficiently detailed to tabulate. Part II of the MAPI survey dealt with depreciation policy. Partial results are presented in Table 7. Other features of the MAPI study are presented in Table 8.

Data in Table 7 indicate that approximately two-thirds of the reporting companies employed "liberalized depreciation" for income tax reporting. Of those using "liberalized depreciation" about one-half use the declining balance method and the other half use the sum of the years-digits.

Most of the respondents (86 per cent) employ the same depreciation methods for financial and income tax reporting. (Table 8). "Liberalized depreciation" is used by 62 per cent of the respondents for income tax reporting. Since 85 per cent employ consistent methods for both purposes a substantial majority employs "liberalized depreciation" for financial, as well as for income tax, reporting.

Table 8 reveals that in 1956 most of the respondents (74 per cent) agreed that the accelerated depreciation rates under the 1954 Code were reasonable. There was less agreement (55 per cent) concerning the life expectancy permitted for facilities under the 1954 Code. In fact, respondent replies indicate that they desire more discretion as to life expectancy of facilities. If they were granted more discretion, virtually all firms (94 per cent) agreed that the

TABLE 7

DEPRECIATION METHODS USED BY 296 MANUFACTURING COMPANIES IN THE UNITED STATES FOR INCOME TAX REPORTING, 1956.

Method	Number	Per Cent
Declining Balance	92	31
Sum of Years-Digits	92	31
Straight Line	107	36
Other	<u>5</u>	<u>2</u>
Total	296	100

Source: Machinery and Allied Products Institute, Equipment Replacement and Depreciation - Policies and Practices, 1956, p. 14.

TABLE 8

RESPONSES TO QUESTIONS DEALING WITH DEPRECIATION POLICY FROM 259
TO 281 MANUFACTURING COMPANIES IN THE UNITED STATES, 1956

Question	Number of Responses	Per Cent	
		Yes	No
Do you take the same rates of depreciation for both book and for income tax purposes?	281	85	15
Do you believe the writeoffs allowable under the 1954 Code are adequate as to:			
(a) Method of distributing depreciation over the service life?	262	74	26
(b) Estimates of life expectancy?	259	55	45
If the selection of useful lives of facilities were wholly at your discretion, would you use the same life estimates for financial and income tax reporting?	262	94	6

Source: Machinery and Allied Products Institute, Equipment Replacement and Depreciation - Policies and Practices, 1956, pp. 14-16.

availability of longer life expectancies would make it unnecessary to account separately for tax depreciation and financial depreciation.

The MAPI depreciation study was the most comprehensive one of its kind in 1956. The study dealt only with the practice of manufacturing companies, but the firms varied in size from small to large. The purpose of the study was to estimate the influence of the 1954 Internal Revenue Code depreciation amendments on depreciation practice in the capital goods industries.

Treasury Department Depreciation Study

On January 5, 1961 the Treasury Department released a preliminary report on the results of its depreciation survey initiated in July, 1960.⁷ The writer was able to obtain a copy of the preliminary report in Washington in March, 1962 from the Office of Tax Analysis in the Treasury Department.⁸

The depreciation study was conducted jointly by the Treasury and the Small Business Administration. It has attracted much attention from both industry and Congress. The purpose of the study was to obtain data from a cross section of taxpayers to facilitate an evaluation of present depreciation provisions of the Internal Revenue Code. Various professional, trade, and business organizations co-operated in the development of the survey. Professor E. Cary Brown

has stated that "the best sources of data for accelerated depreciation will be the new Treasury studies."⁹

The Treasury Department mailed 2,701 schedules and questionnaires to large corporations, of which 1,918 were returned in time to be included in the preliminary report. The Treasury anticipates about an 80 per cent ultimate response from larger firms. In the small business portion of the survey 7,593 questionnaires were mailed, of which 1,177 were returned in time to be included in the preliminary report. The Treasury did not mention an anticipated percentage response for small firms but the report indicated a low response was anticipated due to the relatively high turnover, including changes of ownership, name, and address, among small enterprises. The preliminary report mentions that an additional 361 questionnaire returns were volunteered by firms not included in the initial sample. Most of the volunteer returns were from small firms. Including the volunteer returns, data have been received from 3,500 respondents, of which about 2,000 may be classified as large and 1,500 as small firms.

Partial results of the preliminary report are presented in Table 9. Perhaps the most significant finding of the survey was that 70 per cent of the responding large firms reported that they employ one or more of the "liberalized depreciation" methods for income tax reporting. More large firms used the declining balance than the sum of the

TABLE 9

PERCENTAGE DISTRIBUTION OF DEPRECIATION METHODS USED BY 3,476 COMPANIES
IN THE UNITED STATES FOR INCOME TAX REPORTING, 1961

Method	Large Firms	Small Firms
Declining Balance and Sum of Years-Digits ¹	70	53
Other Methods	<u>30</u>	<u>47</u>
Total	100	100

¹No distinction between the two methods was provided in the study.

Source: Treasury Department, Preliminary Report on Treasury Depreciation Survey, January 5, 1961.

years-digits. Among the smaller firms, 53 per cent reported they were using one or more of the liberalized depreciation methods for income tax reporting. Here again the declining balance method was the most popular of the liberalized methods.

Approximately 22 per cent of the large firms elected to use the additional first-year depreciation allowance permitted in 1958. This compares with about 37 per cent of the smaller firms. This differential is to be expected due to the relative relief received by small firms and large firms under the Small Business Tax Revision Act of 1958.

Table 10 compares depreciation practice for financial and income tax reporting. The data reveal that 6 out of 10 large corporations use the same depreciation method for financial and income tax reporting. About 3 out of 10 used a smaller figure for financial reporting than for income tax reporting. One out of 10 showed a higher figure for income tax reporting than in their financial reports. Virtually all small firms (92 per cent) used the same depreciation method in their financial and income tax reports.

Most firms using a "liberalized depreciation" method in their income tax returns and the straight line method in their financial reports provided for tax deferrals. They did this because the executives of these corporations felt that they would be liable for higher income taxes at a later date. Other firms, however, felt that continuous investment

TABLE 10
 PERCENTAGE DISTRIBUTION OF DEPRECIATION METHODS USED BY 3,476
 COMPANIES IN THE UNITED STATES FOR FINANCIAL
 AND INCOME TAX REPORTING, 1961

Comparison of Methods	Large Firms	Small Firms
Same Method Used for Financial and Income Tax Reporting	61	92
Depreciation Lower for Financial Reporting Than for Income Tax Reporting	28	4
Depreciation Higher for Financial Reporting Than for Income Tax Reporting	<u>11</u>	<u>4</u>
Total	100	100

Source: Treasury Department, Preliminary Report on Treasury
 Depreciation Survey, January 15, 1961, pp. 13-16.

in the future rendered such tax deferrals permanent.

About one-third of the large firms and more than one-half of the small firms regard the present allowances for income tax reporting reasonably satisfactory. On the other hand, about two-thirds of the large firms and almost half of the smaller firms consider the present allowances unsatisfactory. Five per cent did not express an opinion.

About two-thirds of both large and small firms stated that additional "liberalized depreciation" would materially increase their capital expenditures. Also, a substantial majority of responding firms (86 per cent of the large firms and 97 per cent of the small ones) reported that additional "liberalized depreciation" would result in using the same depreciation method for financial and income tax depreciation.

Approximately 58 per cent of the large firms indicated that future rates of obsolescence would increase significantly. The remaining 42 per cent stated the opposite. Only 34 per cent of the small firms indicated that future obsolescence rates would experience a sharp upturn.

A distinctive feature of the Treasury Department study is that it surveys depreciation practices of small and large firms. The study was conducted under the auspices of the Treasury Department and the Small Business Administration.

Summary

The purpose of this chapter was to examine empirical studies dealing with the use of "liberalized depreciation." Table 11 summarizes significant data from the five studies.

A sizeable majority of the firms employ one or more of the "liberalized depreciation" methods permitted under the Internal Revenue Code of 1954. Data presented in three of the studies are based on income tax reporting; data in another study are based on financial reporting, and data in the remaining are based on a combination of income tax and financial reporting. Other data reveal that most firms employ the same methods for financial and tax reporting. It follows that "liberalized depreciation" is widely employed in financial and income tax reporting by large and small firms.

TABLE 11

PERCENTAGE DISTRIBUTION OF DEPRECIATION METHODS USED BY
COMPANIES PARTICIPATING IN FIVE EMPIRICAL STUDIES
IN THE UNITED STATES, 1956-1961

Study ¹	Liberalized	Method Straight Line	Other
1. Financial Executives Research Foundation	77	23	-
2. National Association of Accountants	73	26	1
3. American Institute of Certified Public Accountants	61	29	10
4. Machinery and Allied Products Institute	62	36	2
5. Treasury Department Large Firms	70	30 ^a	-
Small Firms	53	47 ^a	-

¹Data in study 1 are based on a combination of income tax and financial reporting. Data in studies 2, 4, and 5 are based on income tax reporting. Data in study 3 are based on financial reporting.

^aBreak down between straight line and other not provided in the study.

Source: Tables 1, 4, 6, 7, and 9, of this study.

FOOTNOTES

¹Controllers Institute Research Foundation, Inc., What Depreciation, A Report Prepared by W.J. Littlefield, Research Director (New York: Controllers Institute Research Foundation, Inc., April 20, 1960).

²Allocation of deferred income taxes is discussed in Chapter V.

³Bureau of the Budget, Standard Industrial Classification Manual (Washington: U.S. Government Printing Office, 1957).

⁴National Association of Accountants, Current Practice in Accounting for Depreciation, Research Report No. 33 (New York: National Association of Accountants, April 1, 1958).

⁵American Institute of Certified Public Accountants, Accounting Trends and Techniques, Fifteenth Edition (New York: American Institute of Certified Public Accountants, 1961).

⁶Machinery and Allied Products Institute, Equipment Replacement and Depreciation--Policies and Practices (Washington: Machinery and Allied Products Institute, 1956).

⁷Treasury Department, Preliminary Report on Treasury Depreciation Survey, A-1014, A Report Prepared by the Treasury Department (Washington: January 5, 1961).

⁸In a letter dated April 21, 1962, Mr. Harvey Brazer, Director - Office of Tax Analysis of the Treasury Department, informed the writer that he would receive a copy of the final report if and when the final report is completed.

⁹Letter from Dr. E. Cary Brown, Professor of Economics Massachusetts Institute of Technology, April 23, 1962.

CHAPTER IV

IMPACT OF "LIBERALIZED DEPRECIATION" ON INVESTMENT DECISIONS

Many investment decisions are made by choosing among alternative courses of action. The extent of quantitative analysis that is used to facilitate decision making varies from firm to firm. To some extent management makes investment decisions intuitively. They do this because they may be unaware of other ways of making the decision. In other cases there may be a lack of accurate data to evaluate the alternatives. In many situations, however, it is possible to reduce consequences of the various alternatives to a quantitative basis. This may be accomplished by the use of accounting data. The present chapter is concerned with these various quantitative approaches.

Depreciation exerts an influence on investment decisions through its effect on net income. Income taxes are based on net income and depreciation is deducted from gross income to arrive at net taxable income. What constitutes income and what constitutes depreciation for income tax reporting is determined by Congress, the Treasury, and the courts.

These definitions may differ from definitions management employs when making investment decisions. Nevertheless, income tax laws materially affect investment decisions because of high rates that are levied on taxable income in the United States. The government's definition of income is important to management of corporations because government takes 52 per cent of corporate net income in the form of an income tax levy. Taxes affect investment decisions because they constitute cash flows. Because income taxes require cash outlays management is attracted to income tax features that minimize this cash flow.

A principal reason advanced for adoption of the "liberalized depreciation" methods in 1954 was that the faster write-off would encourage management to invest in plant and equipment more readily than under conventional straight line depreciation. Since investment decisions are made in various ways care must be used in evaluating the effect of alternative accounting procedures, such as using different depreciation methods, on investment decisions. This chapter is concerned with the effect of "liberalized depreciation" on investment decisions. Contemporary quantitative methods used in evaluating alternative investment proposals are examined. The writer will keep in mind these words of caution expressed by Professor Sidney Davidson, "we know so little about how investment decisions are made, but we can generalize by saying that acceleration increases the profitability

of investment, or put alternatively that it decreases the cost of plant assets."¹

Time Discount Gain

By employing one of the "liberalized depreciation" methods the taxpayer realizes an interest or time-discount gain by receiving the tax benefit of depreciation allowances at an earlier date. The shift in timing is important because a dollar on hand today is worth more than a dollar that will be received at some future date. The present value of an amount to be received in the near future is larger than the present value of the same amount to be received in the distant future. When dealing with depreciation the amount is the savings in income tax dollars that results from depreciation deductions.

Table 12 illustrates a comparison of present values of different depreciation methods. The 10 per cent discount rate represents the minimum return that management expects from investing in the asset. The selection of the 10 per cent rate is arbitrary. The rate used in actual practice will vary from firm to firm, as well as for different types of asset acquisitions within a particular firm.

Table 12 reveals that the present value of the stream of deductions for the straight line method is \$7,580, for the declining balance \$8,108, and for the sum of the years-digits \$8,059. Footnote (b) in Table 12 refers to the optimum time for switchover from the declining balance to the straight

TABLE 12

CALCULATION OF THE PRESENT VALUE OF DEPRECIATION DEDUCTIONS FOR
THREE DEPRECIATION METHODS.

(Assume: Asset Cost of \$10,000, Useful Life of 5 Years,
10 Per Cent Discount Rate)

Year	Method			Present Value Factor	Present Value		
	Straight Line	Declining ^a Balance	Sum of Years-Digits		Straight Line	Declining Balance	Sum of Years-Digits
	(1)	(2)	(3)	(4)	(1)x(4)	(2)x(4)	(3)x(4)
1	\$ 2,000	\$ 4,000	\$ 3,333	0.909	\$ 1,818	\$ 3,636	\$ 3,030
2	2,000	2,400	2,667	0.826	1,652	1,982	2,203
3	2,000	1,440	2,000	0.751	1,502	1,081	1,502
4	2,000	1,080 ^b	1,333	0.683	1,366	738	910
5	2,000	1,080	667	0.621	1,242	671	414
Total	\$10,000	\$10,000	\$10,000		\$ 7,580	\$ 8,108	\$ 8,059

^aTwice straight line rate

^bSwitchover from declining balance to straight line elected.

Straight line depreciation for the 4th year:

Remaining book value at the end of the 3d year
Remaining life

\$2,160 (\$10,000-7,840)
2 years

Straight line depreciation for 4th year

\$ 1,080

Declining balance depreciation for 4th year:

Remaining book value at the end of the 3d year
Declining balance rate

\$2,160 (\$10,000-7,840)
.40

Declining balance depreciation for 4th year

\$ 864

line method. This switchover possibility merits some explanation. Section 167 (e) of the Internal Revenue Code permits a taxpayer to change from the declining balance method to the straight line method any time during the useful life of the property. This switchover can be accomplished at the discretion of the taxpayer without the consent of the Internal Revenue Service. Selection of the optimal period to switch from the declining balance to the straight line method is based on a simple computation. The depreciation charge computed by the straight line method must be as large or larger than the depreciation charge computed by the declining balance method. The straight line depreciation is computed by dividing the remaining book value of the asset in question by the remaining life of the asset. The depreciation charge so determined should be compared with the charge that would be available under a continuation of the declining balance method. If the straight line depreciation charge is as high or higher than under the declining balance depreciation charge, the switchover is desirable. Sidney Davidson and David F. Drake have suggested an approach to follow in selecting the optimum period to switch from the declining balance to the straight line method in a recent article published by the University of Chicago.²

The "liberalized depreciation" methods yield present values that are about 6 per cent higher than the present value of the straight line method in the illustration in

Table 12. As suggested above, depreciation tax policy for the firm should be aimed at maximizing the present value of the stream of income tax savings. Adoption of one of the "liberalized depreciation" methods will result in an income tax savings. The amount of savings may be computed by multiplying the difference between the present value of the straight line method and the liberalized method by the current income tax rate (52 per cent). The income tax savings that would result by selecting the declining balance method over the straight line method would be \$275.00 $(\$8,108 - 7,580) \times .52$. The income tax savings that would materialize as a result of selecting the sum of the year-digits method in lieu of the straight line method would be \$249.00 $(\$8,059 - 7,580) \times .52$.

In the illustration presented in Table 12 the present value of the declining balance method exceeds the present value of the sum of the years-digits method. In some cases the present value of the sum of the years-digits method will be the larger. The optimal method of "liberalized depreciation" is dependent upon three parameters as suggested by Davidson and Drake. They are: (1) the useful life of the asset, (2) the cost of the asset, and (3) the salvage value of the asset. In general, a long service life favors the sum of the years-digits method, a high cost of capital favors the declining balance method, and a high salvage value favors the declining balance method.

These alternatives are illustrated in Tables 13 through 15.

Table 13 shows that a high discount rate tends to favor the declining balance method over the sum of the years-digits method. At the low discount rate of 1 per cent, the present value of the sum of the years-digits is higher. As the discount rate increases to 10 per cent, the present value of the declining balance method is higher.

Table 14 shows that a low salvage value tends to favor the sum of the years-digit method over the declining balance method. Assuming a salvage value of zero, the present value of the sum of the years-digit method is higher than the declining balance method, irrespective of changing discount rates.

Table 15 shows that a reduction in the useful life of an asset tends to favor the declining balance method over the sum of the years-digit method. It should be noted that Table 15 holds the other two parameters, the discount rate and the salvage value, constant.

Tables 13 through 15 illustrate parameter tendencies which facilitate selecting the optimum "liberalized depreciation" method. The optimum method is the one that yields the greatest present value. The present value calculations that are necessary to select the optimum "liberalized depreciation" method may become quite time consuming. This is particularly true when one considers the large number of combinations that would be possible by varying the three parameters.

TABLE 13
 DEPRECIATION CHARGES COMPUTED BY TWO METHODS FOR AN ASSET COSTING \$10,000,
 WITH EIGHT-YEAR SERVICE LIFE, AND 5 PER CENT SALVAGE VALUE

Year	Depreciation Charge		Present Value Discounted at 1 Per Cent		Present Value Discounted at 10 Per Cent	
	SYD ¹	DDB ²	SYD	DDB	SYD	DDB
1	\$ 2,111	\$ 2,500	\$ 2,090	\$ 2,475	\$ 1,919	\$ 2,273
2	1,847	1,875	1,810	1,838	1,526	1,549
3	1,584	1,406	1,541	1,365	1,190	1,056
4	1,320	1,055	1,269	1,014	902	721
5	1,055	791	1,003	752	655	491
6	791	625 ^a	745	589	446	353
7	528	624	493	582	271	320
8	264	624	244	576	123	291
Total	\$ 9,500	\$ 9,500	\$ 9,195	\$ 9,191	\$ 7,032	\$ 7,054

^aSwitchover to straight line method elected.

¹Sum of the Years-Digits.

²Double Declining Balance.

Source: Reproduced from Sidney Davidson and David F. Drake, "Capital Budgeting and the 'Best' Tax Depreciation Method," The Journal of Business of the University of Chicago, Volume XXXIV (October, 1961), p. 445, Table 1.

TABLE 14

DEPRECIATION CHARGES COMPUTED BY TWO METHODS FOR AN ASSET COSTING \$10,000,
WITH EIGHT-YEAR SERVICE LIFE, AND ZERO SALVAGE VALUE

Year	Depreciation Charge		Present Value Discounted at 1 Per Cent		Present Value Discounted at 10 Per Cent	
	SYD ¹	DDB ²	SYD	DDB	SYD	DDB
1	\$ 2,222	\$ 2,500	\$ 2,200	\$ 2,475	\$ 2,020	\$ 2,273
2	1,944	1,875	1,905	1,838	1,606	1,549
3	1,667	1,406	1,619	1,365	1,252	1,056
4	1,389	1,055	1,335	1,014	949	721
5	1,111	791 ^a	1,057	752	690	491
6	833	791	785	745	470	446
7	556	791	519	738	285	406
8	278	791	257	730	130	369
Total	\$10,000	\$10,000	\$ 9,677	\$ 9,657	\$ 7,402	\$ 7,311

^aSwitchover to straight line method elected.

¹Sum of the Years-Digits.

²Double Declining Balance.

Source: Reproduced from Sidney Davidson and David F. Drake, "Capital Budgeting and the 'Best' Tax Depreciation Method," The Journal of Business of the University of Chicago, Volume XXXIV (October, 1961), p. 446, Table 2.

TABLE 15

DEPRECIATION CHARGES COMPUTED BY TWO METHODS FOR AN ASSET COSTING \$10,000,
WITH FOUR-YEAR SERVICE LIFE, AND ZERO SALVAGE VALUE.

Year	Depreciation Charge		Present Value Discounted at 1 Per Cent		Present Value Discounted at 10 Per Cent	
	SYD ¹	DDB ²	SYD	DDB	SYD	DDB
1	\$ 4,000	\$ 5,000	\$ 3,960	\$ 4,950	\$ 3,636	\$ 4,545
2	3,000	2,500	2,940	2,450	2,478	2,065
3	2,000	1,250 ^a	1,942	1,214	1,502	939
4	1,000	1,250	961	1,201	683	854
Total	\$10,000	\$10,000	\$ 9,803	\$ 9,815	\$ 8,299	\$ 8,403

^aSwitchover to straight line method elected.

¹Sum of the Years-Digits.

²Double Declining Balance.

Source: Reproduced from Sidney Davidson and David F. Drake, "Capital Budgeting and the 'Best' Tax Depreciation Method," The Journal of Business of the University of Chicago, Volume XXXIV (October, 1961), p. 446, Table 3.

Sidney Davidson and David F. Clark have suggested a technique to overcome this difficulty. It consists essentially of treating one of the parameters as a variable. They suggest letting the discount parameter vary. As Davidson and Drake point out, this treatment is similar to Irving Fisher's rate of return over cost as well as Armen A. Alchian's rate of interest computations.³

In actual business practice management may not engage in present value analysis to facilitate investment decisions. "It seems reasonable to assume, however, that virtually all businessmen recognize an advantage in receiving income in the near future as compared with the same amount of income in the more distant future, even though they may not make a formal calculation of the present value of the two sums."⁴

Availability of Financial Resources

Internal Financing.--"Liberalized depreciation" may serve as an investment stimulus by increasing the availability of financial resources. According to Richard Goode, "In view of the imperfections of the capital market, this consideration is not adequately reflected in the time discount factor."⁵ A growing firm will be able to finance a larger portion of its investment from retained earnings by employing "liberalized depreciation" for income tax reporting. George Terborgh, Research Director, Machinery and Allied Products Institute has observed:

. . . it is not surprising that tax depreciation allowances - or more accurately, the funds they make available when earned - are normally the largest source of business investment capital. In recent years, these allowances (including special amortization) have averaged almost two-thirds of fixed-asset expenditures.⁶

There is a common misconception that income tax savings which result by using "liberalized depreciation" are lost in the long run. For a single asset, larger depreciation charges during earlier years are offset by smaller depreciation charges in later years. Therefore, tax savings in the earlier years are offset by tax losses as depreciation charges decline. However, the effect is different if the firm has several assets which are replaced as retirements occur. Assuming a firm continues to expand, additional permanent tax savings result by employing "liberalized depreciation."⁷ The income tax savings will be lost only if the firm partially or completely liquidates its investment in depreciable assets. These effects are illustrated in Table 16. An inherent assumption is that income tax rates remain the same.

An analysis of Table 16 suggests certain important conclusions. During the first ten years gross assets are growing. During this growth period the cumulative total of depreciation charges for the two liberalized methods are larger than the cumulative total under the straight line method.

During the succeeding ten years gross assets remain unchanged in total. For this period annual depreciation

TABLE 16

ILLUSTRATION SHOWING ANNUAL AND CUMULATIVE DIFFERENCES IN DEPRECIATION CHARGES UNDER STRAIGHT LINE, SUM-OF-THE-YEARS DIGITS AND DECLINING BALANCE METHODS

To demonstrate differences in the three depreciation methods listed above, the following example gives annual and cumulative depreciation charges for three successive ten-year periods. In the first period, it is assumed that assets having a ten-year life and costing \$2,000 are acquired each year. During this period there are no retirements. In the second period, retirement of assets acquired during the preceding period begins. It is assumed that assets retired are replaced each year with new assets which also have a ten-year life, but there is no net addition to the amount of depreciable assets. In the third period, no additions or replacements occur and the investment in depreciable assets is completely liquidated by the end of the period.

In calculating depreciation shown in this exhibit, a full year's depreciation is taken on assets in the year of acquisition and no depreciation is taken in the year of retirement.

Year	Additions	Retirements	Gross Assets at End of Year	Annual Depreciation Charge		
				Straight Line	Sum-of-the years digits	Declining Balance
1	\$ 2,000	\$ ----	\$ 2,000	\$ 200	\$ 364	\$ 400
2	2,000	-----	4,000	400	692	720
3	2,000	-----	6,000	600	982	976
4	2,000	-----	8,000	800	1,236	1,178
5	2,000	-----	10,000	1,000	1,454	1,342
6	2,000	-----	12,000	1,200	1,636	1,474
7	2,000	-----	14,000	1,400	1,782	1,580
8	2,000	-----	16,000	1,600	1,892	1,664
9	2,000	-----	18,000	1,800	1,964	1,732
10	2,000	-----	20,000	2,000	2,000	2,000
Totals at End of 10 Years	\$20,000	\$ ----	\$20,000	\$11,000	\$14,002	\$13,066

TABLE 16--Continued

Year	Additions	Retirements	Gross Assets at End of Year	Annual Depreciation Charge		
				Straight Line	Sum-of-the years digits	Declining Balance
11	\$ 2,000	\$ 2,000	\$20,000	\$ 2,000	\$ 2,000	\$ 2,000
12	2,000	2,000	20,000	2,000	2,000	2,000
13	2,000	2,000	20,000	2,000	2,000	2,000
14	2,000	2,000	20,000	2,000	2,000	2,000
15	2,000	2,000	20,000	2,000	2,000	2,000
16	2,000	2,000	20,000	2,000	2,000	2,000
17	2,000	2,000	20,000	2,000	2,000	2,000
18	2,000	2,000	20,000	2,000	2,000	2,000
19	2,000	2,000	20,000	2,000	2,000	2,000
20	2,000	2,000	20,000	2,000	2,000	2,000
Totals at End of 20 Years	\$40,000	\$20,000	\$20,000	\$31,000	\$34,002	\$33,066
21	\$ ----	\$ 2,000	\$18,000	\$ 1,800	\$ 1,636	\$ 1,600
22	----	2,000	16,000	1,600	1,308	1,280
23	----	2,000	14,000	1,400	1,018	1,024
24	----	2,000	12,000	1,200	764	822
25	----	2,000	10,000	1,000	546	658
26	----	2,000	8,000	800	364	526
27	----	2,000	6,000	600	218	420
28	----	2,000	4,000	400	108	336
29	----	2,000	2,000	200	36	268
30	----	2,000	----	---	---	---
Totals at End of 30 Years	\$40,000	\$40,000	\$ ----	\$40,000	\$40,000	\$40,000

81

Source: Reproduced from National Accounting Association, "Current Practice in Accounting for Depreciation," Research Report No. 33 (April 1, 1958), p. 7.

charges are the same in amount for all three depreciation methods. Therefore, cumulative totals at the end of twenty years reflect the same differences they did at the end of the first ten years. This means that the larger depreciation charges provided by the "liberalized depreciation" methods during the first ten years have not been lost.

During the third ten year period the amount of depreciable assets is decreasing. This results in a reversal of the pattern of differences reflected in the first ten year period. When the liquidation of the depreciable assets is completed the total cumulative depreciation is the same for all three depreciation methods. The larger depreciation charges provided by the liberalized methods in the period of growth are offset by smaller depreciation charges during the years of decline of the depreciable assets.

Many firms at least maintain their investment in plant and equipment. Other firms are continually expanding plant and equipment. Therefore, the first two ten-year periods may be more representative of actual business practice than the last ten year period.

To summarize, income tax savings in earlier years, made possible by employing a "liberalized depreciation" method, are not lost as long as the firm continues to replace its plant and equipment. If the firm continues to expand its plant and equipment tax savings will be permanent. Only if the firm liquidates by retiring all its assets will the tax

savings be lost. There will still be a gain from employing "liberalized depreciation," however. The gain is measured in terms of present value differentials. Tax savings in early years will normally be employed by the firm as working capital or as an investment. The return that is earned by employing the tax savings will not be lost.

External Financing.--"Liberalized depreciation" makes it easier for the firm to finance investments internally from retained earnings. In addition, employing "liberalized depreciation" may make it easier for firms to raise outside capital. As a general rule creditors will insist that a loan to purchase plant and equipment be repaid over a relatively short period of time. They will want to be assured that the loan will be repaid before the asset wears out or becomes obsolete. In short, creditors will be concerned with the firm's ability to repay the loan in a reasonable period of time. Adoption of "liberalized depreciation" methods will minimize income tax flows that normally interfere with repayment of loans.

Payback Period Analysis

Payback period analysis is sometimes employed as a quick but crude method of appraising investment proposals. The payback period is the length of time required for the additional cash receipts generated by a new asset to equal the cost of the asset. The formula for computing the payback period is:

$$\frac{\text{Differential Capital Investment}}{\text{Differential Annual Net Receipts}} = \text{Payback Period}$$

Some companies establish arbitrary maximum acceptable payback periods for accepting or rejecting investments in assets. In general, the more risk involved in making the investment, the shorter the maximum acceptable payback period becomes since presumably the higher risk investment alternatives are associated with higher differential annual receipts. The payback approach to evaluating alternative investment proposals has at least three major shortcomings. They are:

- (1) There is no objective way to decide on standards for how long the payback period should be.
- (2) The relative profitability of alternatives is not always obvious, i.e. two machines with the same payback periods might have different useful lives.
- (3) The analysis disregards the contribution an asset makes to the production of revenue after the payback period.

Despite the shortcomings of the payback analysis, it may be fruitfully employed as a point of origin for appraising various investment proposals. Payback analysis should normally be supplemented by more refined analysis such as the determination of rates of return for alternative investment proposals. Richard Goode writes:

Despite its crudity, the pay-off-period approach seems to be a very sensible method of allowing for risk and uncertainty. Literally interpreted, it implies that uncertainty regarding the future is so great that the possibility of realizing earnings from the asset after the end of the pay-off period is not worth taking into account. Although this is an extreme assumption, it is clearly true that risk increases with the duration of

a commitment and that uncertainties of the distant future are much greater than those of the near future.⁸

The question may be raised: what effect does depreciation, or more specifically "liberalized depreciation," have on the payback period? As noted previously, the payback period computation is in terms of cash flow. In the analysis depreciation is added back to net profit to obtain net profit in terms of cash flow. Net profit before depreciation is the relevant figure for computing the payback period. In short, depreciation as a non-cash charge should be excluded from the analysis. It would seem, therefore, that the particular depreciation method employed would not affect the computation of the payback period. Depreciation does affect cash flow indirectly, however, through its effect on the amount of periodic income taxes. Income tax levies, which constitute tax flows, are based on net profits after deducting depreciation. Therefore, higher depreciation charges made available by selecting a liberalized method reduce reported taxable profits. The reduced reported profits in turn minimize income tax flows. The effect of "liberalized depreciation" on the payback period is illustrated in Table 17. As has been true throughout most of this study, the corporate form of business is assumed.

A perusal of Table 17 reveals that selection of the declining balance method in lieu of the straight line method shortens the payback period from 4.21 years to 3.33 years. This is a decrease of approximately 20 per cent, which is a

TABLE 17
 ILLUSTRATION OF PAYBACK PERIOD COMPUTATION USING THE STRAIGHT LINE
 AND DOUBLE DECLINING BALANCE METHODS OF DEPRECIATION
 (Assume: Asset Cost of \$32,000, Useful Life of 8 Years,
 Salvage Value of Zero)

	Depreciation Method	
	Straight Line	Double Declining Balance
Additional Annual Sales Revenue	\$ 60,000	\$ 60,000
Deduct:		
Cost of Materials, Labor and Over- head other than Depreciation	\$ 31,000	\$ 31,000
Depreciation of New Machine	4,000	8,000
Additional Selling and Administra- tive Costs	<u>17,800</u>	<u>17,800</u>
Net Profit before Income Taxes	\$ 7,200	\$ 3,200
Income Taxes (assumed rate 50%)	<u>3,600</u>	<u>1,600</u>
Net Profit after Income Taxes	<u>\$ 3,600</u>	<u>\$ 1,600</u>
Computation of Payback Period:		
Net Profit after Income Taxes	\$ 3,600	\$ 1,600
Add Depreciation (Non- Cash-Charge)	<u>4,000</u>	<u>8,000</u>
Total Available for Payback	<u>\$ 7,600</u>	<u>\$ 9,600</u>
Payback Period Computation:	$32,000 \div 7,600 = 4.21$ years	$32,000 \div 9,600 = 3.33$ years

material change. The first year depreciation charge was used in the declining balance illustration. However, selection of a later year within the payback period (1 - 3.33 years) would still result in a faster payback period than under straight line depreciation. This is true because depreciation charges using "liberalized depreciation" would be higher than straight line depreciation for the first 3.82 years in our example.

As suggested earlier, payback period analysis is subject to several limitations as an investment proposal tool. To the extent that it is used in making investment decisions, however, the impact of "liberalized depreciation" on the analysis should be considered.

Relationship of Depreciation to Rate of Return

In a previous section of this chapter the writer mentioned the impact "liberalized depreciation" has on the availability of financial resources. The advantage of faster depreciation deductions does not necessarily depend on reinvestment of income tax savings, however. An additional advantage is the gain that appears in the form of a higher rate of after-tax return on investments in plant and equipment. This advantage may be illustrated by a simple example as follows:

If an investor commits \$1,000 today and gets back \$1,100 a year from now, his rate of return on the investment is 10 per cent per annum. If, however, he gets back the \$1,100 at the end of 6 months, his rate of return is 20 per cent per annum. Similarly, an earlier receipt of

the amounts available for capital recovery and after tax return over the life of a depreciable asset, arising from the use of a faster depreciation method, spells a higher rate of return.⁹

This section is devoted to discussing three methods for computing rate of return. The impact of "liberalized depreciation" on each method will be examined briefly.

Unadjusted Return Method.--This method is commonly referred to as the "unadjusted rate of return" because it does not allow for differences in timing of cash receipts and payments. The method is also called the "average rate of return" method. The formula for computing the "unadjusted rate of return" follows:

$$\frac{\text{Additional Annual Income}}{\text{Average Additional Investment}} = \text{Unadjusted Rate of Return}$$

Additional annual income is determined by subtracting depreciation and income taxes from the annual operating savings. Average additional investment is determined by adding the differential initial investment to the differential ending salvage value and dividing by two.

The "unadjusted rate of return" method is subject to at least one major weakness. It values a dollar of savings to be realized in the distant future just as highly as a dollar expected in the near future. This has the effect of overstating the computed rate of return.

Table 18 shows the computation of the "unadjusted rate of return" after tax using two different depreciation methods. The basic data are the same as was used in Table 17.

TABLE 18

ILLUSTRATION OF UNADJUSTED RATE OF RETURN COMPUTATION USING THE STRAIGHT
 LINE AND DOUBLE DECLINING BALANCE METHODS OF DEPRECIATION
 (Assume: Asset Cost of \$32,000, Useful Life of 8 Years,
 Salvage Value of Zero)

	Depreciation Method	
	Straight Line	Double Declining Balance
Additional Annual Sales Revenue	\$ 60,000	\$ 60,000
Deduct:		
Cost of Materials, Labor, and Over- head other than Depreciation	\$ 31,000	\$ 31,000
Depreciation of New Machine	4,000	8,000
Additional Selling and Administra- tive Costs	17,800	17,800
	<u>52,800</u>	<u>56,800</u>
Net Profit before Income Taxes	\$ 7,200	\$ 3,200
Income Taxes (Assumed rate 50%)	3,600	1,600
Net Profit after Income Taxes	<u>\$ 3,600</u>	<u>\$ 1,600</u>
Computation of Unadjusted Rate of Return:		
Average Investment = $\frac{\$32,000 - 0}{2}$	= \$16,000	
Unadjusted Rate of Return	$\frac{3,600}{16,000} = 22\frac{1}{2}\%$	$\frac{1,600}{16,000} = 10\%$

Analysis of Table 18 suggests that employing "liberalized depreciation" might have a detrimental effect on rate of return in the earlier years of an asset's life. The rate of return using the declining balance method of depreciation for the first year is 10 per cent, as compared to $22\frac{1}{2}$ per cent using straight line depreciation. The differential of $12\frac{1}{2}$ percentage points is attributed to two factors. The depreciation charge differential is \$4,000 which is partially offset by the income tax differential of \$2,000. The net effect results in differential net profit of \$2,000 after income taxes.

The difference between the rate of return employing straight line and declining balance depreciation is misleading. As the useful life of the asset in question expires the rate of return for the declining balance method would eventually become higher than under the straight line method. This is because the annual depreciation charge would eventually be lower for the declining balance method than for the straight line method. On balance, the depreciation charges would be equal which would yield the same rate of return. In fact, an average depreciation charge could have been used for the declining balance method which would have yielded the same annual charge as the straight line method and have resulted in the same rate of return. The first year of the asset's life was selected for comparison, however, in Table 18 to illustrate possible rate of return differentials.

As noted earlier, the "unadjusted rate of return" method does not allow for differences in timing of cash receipts and payments. Therefore, the method is unrealistic and the results should be judged accordingly. This method was presented to illustrate the need for more refined methods of evaluating alternative investment proposals.

Discounted Cash Flow (Rate of Return Variant).--The "rate of return variant" allows for differences in timing of cash receipts and payments. For this reason it is usually referred to as a "scientific" method of computing rate of return. Its determination is dependent upon the use of present value tables.

Professor Robert Eisner has observed that, "merely raising or 'liberalizing' depreciation, except for its tax effects, (italics mine) does nothing to the rate of return, the availability of financial resources, risk and uncertainty, or time discount."¹⁰ Professor J. Fred Weston supports the position of Professor Eisner in his testimony before the Ways and Means Committee in November, 1959 by the following comments:

At the outset of a discussion of the tax treatment of depreciation, it is important to recognize that if it were not for the value of depreciation as a deduction for tax purposes, business managers would not need to consider depreciation in making investment decisions. The substantial literature on investment decisions has now fully demonstrated that scientific methods for determining the profitability of investment opportunities need not take depreciation into account except for tax effects¹¹ (Italics mine).

It seems to this writer that the only relevant rate of return computation is return after income taxes. This being the case "liberalized depreciation" may have a significant impact on "discounted cash flow" rate of return calculations. The effect of employing "liberalized depreciation" is to increase net cash receipts during the early years of an asset's life by decreasing income tax flows. A stream of declining annual receipts has a greater present value than a uniform stream which yields the same total for a given period of years. The higher present value, therefore, yields a higher rate of return. The time discount gain aspect was illustrated in Table 12.

Computing the "rate of return variant" involves the following steps:

1. Estimate the initial net cost of the investment proposal, which is denoted C.
2. Estimate the amount of net cash receipts for each future period, which is denoted R.
3. Estimate the useful life of the asset.

To determine the "rate of return variant" requires the use of present value tables and the following formula:

$$P = \frac{C}{R}$$

Determining the rate of return involves substituting the amounts of C and R in the formula and determining the required P ratio. Then by the use of tables which give the present value of \$1 received annually for N years, and by

using the P ratio and the useful life of the proposed investment, the expected rate of return on investment is determined. The exact indicated rate may be determined by interpolation.

Depreciation exerts an influence on the rate of return by its impact on income tax flows. Income taxes may constitute a material portion of net cash receipts used in the calculation of the rate of return. Table 19 illustrates the "rate of return variant" computation assuming straight line depreciation. Since straight line depreciation charges are constant, which would not cause differential cash receipts to vary, a formula may be used to illustrate the effect of straight line depreciation on the rate of return. Table 19 reflects a rate of return of approximately 23 per cent.

A variation of the "discounted cash flow" method may be employed when cash receipts vary. The mechanics of this approach consist essentially of determining the interest rate that discounts future earnings of an investment proposal down to the present value which is equal to the investment proposal cost. The rate as determined is the rate of return on investment. The merits of this approach are its flexibility. It will handle situations where the estimated annual cash receipts vary from year to year. If the variations in annual cash receipts expected from purchasing an asset are small, a satisfactory approximation of the rate of

TABLE 19

ILLUSTRATION OF DISCOUNTED CASH FLOW RATE OF RETURN VARIANT EMPLOYING THE
STRAIGHT LINE METHOD OF DEPRECIATION
(Assume: Asset Cost of \$10,000, Useful Life of 10 Years,
Salvage Value of Zero)

	New Assets Expected Differential	
	Taxable Income	Net Cash Receipts
Net cash receipts before income taxes	\$ 4,500	\$ 4,500
Depreciation of asset (10,000 x .10)	<u>1,000</u>	
Differential taxable income	\$ 3,500	
Deduct income taxes (52 per cent)	<u>(1,820)</u>	(1,820)
Differential income after income taxes	<u>\$ 1,680</u>	
Differential cash receipts after taxes		<u>\$ 2,680</u>

74

Computation of rate of return:

$$P = \frac{S}{R} = \frac{10,000}{2,680} = 3.731$$

Present value tables reflect the approximate after tax rate of return as 23 per cent.

return may be determined by using average annual cash receipts. This was the approach employed in the rate of return illustrated in the previous section.

Using present value tables requires the use of trial and error techniques.¹² Earnings for each year and residual salvage values are listed first. Thereafter, various discount rates are applied to these amounts until a rate is found that equates their total present value to the cost of the investment. The rate, as determined, is a "discounted cash flow" rate of return.

Since using "liberalized depreciation" will cause annual cash receipts to vary (through its impact on income tax flows), the latter approach should be used to illustrate the relationship of "liberalized depreciation" to the rate of return. Tables 20 and 21 illustrate the effect of "liberalized depreciation" on "discounted cash flow" rate of return computations. Table 20 reflects an approximate after tax rate of return of approximately 25.4 per cent employing declining balance depreciation. Table 21 reflects an after tax rate of return of approximately 25.5 per cent employing sum of the years-digits depreciation. Both are higher than the rate of return employing straight line depreciation illustrated in Table 19.

Discounted Cash Flow (Present-Worth Index Variant).--

This approach is also a "discounted cash flow" method. It is necessary to determine the present value of the earnings of

TABLE 20

ILLUSTRATION OF DISCOUNTED CASH FLOW RATE OF RETURN VARIANT EMPLOYING
 THE DECLINING BALANCE METHOD OF DEPRECIATION
 (Assume: Asset Cost of \$10,000, Useful Life of 20 Years,
 Salvage Value of Zero)

Year	Depreciation	Differential Cash Receipts After Taxes ¹	25% Discount Factor	Present Value	26% Discount Factor	Present Value
(1)	(2)	(3)	(4)	(3)x(4)	(5)	(3)x(5)
1	\$ 2,000.00	\$ 3,200.00	.800	\$ 2,560.00	.794	\$ 2,540.80
2	1,600.00	2,992.00	.640	1,914.88	.630	1,884.96
3	1,280.00	2,825.60	.512	1,446.71	.500	1,412.80
4	1,024.00	2,692.48	.410	1,103.92	.397	1,068.91
5	819.20	2,585.92	.328	848.18	.315	814.56
6	655.36	2,500.79 ^a	.262	655.21	.250	625.20
7	655.36	2,500.79	.210	525.17	.198	495.16
8	655.36	2,500.79	.168	420.13	.157	392.62
9	655.36	2,500.79	.134	335.11	.125	312.60
10	655.36	2,500.79	.107	267.58	.099	247.58
	<u>\$10,000.00</u>			<u>\$10,076.89</u>		<u>\$ 9,795.19</u>

^aSwitchover to straight line method elected.

¹Separately determined by analysis comparable to Table 19. An assumption of annual net cash receipts before income taxes of \$4500 and an income tax rate of 52 per cent is made in the analysis.

Rate of Return

Approximately 25.4 per cent. Interpolating between 25 and 26 per cent reflects that a 25.375 per cent discount rate yields a present value of \$10,000.00, which is the cost of the asset.

TABLE 21

ILLUSTRATION OF DISCOUNTED CASH FLOW RATE OF RETURN VARIANT EMPLOYING
THE SUM OF THE YEARS-DIGITS METHOD OF DEPRECIATION
(Assume: Asset Cost of \$10,000, Useful Life of 10 Years,
Salvage Value of Zero)

Year (1)	Depreciation (2)	Differential Cash Receipts After Taxes ¹ (3)	25% Discount Factor (4)	Present Value (3)x(4)	26% Discount Factor (5)	Present Value (3)x(5)
1	\$ 1,818.18	\$ 3,105.45	.800	\$ 2,484.36	.794	\$ 2,465.73
2	1,636.36	3,010.91	.640	1,926.98	.630	1,896.87
3	1,454.54	2,916.36	.512	1,495.18	.500	1,458.18
4	1,272.73	2,821.82	.410	1,156.95	.397	1,120.26
5	1,090.91	2,727.79	.328	894.72	.315	859.25
6	909.10	2,632.73	.262	689.78	.250	658.18
7	727.27	2,538.18	.210	533.02	.198	502.56
8	545.45	2,443.63	.168	410.53	.157	383.65
9	363.64	2,349.09	.134	314.78	.125	293.64
10	181.82	2,254.55	.107	241.24	.099	223.20
	<u>\$10,000.00</u>			<u>\$10,145.54</u>		<u>\$ 9,861.52</u>

¹Separately determined by analysis comparable to Table 19. An assumption of annual net cash receipts before income taxes of \$4500 and an income tax rate of 52 per cent is made in the analysis.

Rate of Return

Approximately 25.5 per cent. Interpolating between 25 and 26 per cent reflects that a 25.5 per cent discount rate yields a present value of \$10,003.53, which is approximately equal to the cost of the asset.

an investment proposal when using this method. The present value is determined by discounting the earnings at the required earnings rate. The present value of the earnings, as determined, is divided by the cost of the investment which gives the profitability index. Generally, the higher the index the more attractive the investment proposal. In order for the investment proposal to be sufficiently attractive the profitability index should exceed unity.

The "present-worth index" method requires that a minimum earnings rate be established before the calculations are made. The results of this method may differ from the "rate of return variant." However, it is also a "scientific" method and is dependent upon the use of present value tables. The "rate of return variant" examples presented in Tables 20 and 21 serve to illustrate that "liberalized depreciation" contributes to a higher rate of return than straight line depreciation. The same is true if the present-worth index method is used.¹³ Hence, this method will not be illustrated separately in this study.

"Liberalized depreciation" provides a higher rate of return than straight line depreciation employing the "scientific" rate of return methods, provided that income tax rates remain the same.

Small Business Revision Act of 1958

Provisions of the Small Business Tax Revision Act of 1958 that permit an additional first-year depreciation

allowance were discussed in Chapter II. This section is devoted to commenting briefly on the effect of the new initial write off on after-tax rate of return.

The previous section of this chapter illustrated that "liberalized depreciation" contributes to providing a higher rate of return by minimizing cash income tax flows. Since the 1958 Act provided for depreciation in addition to the declining balance and sum of the years-digits method, the impact of the additional allowance on the rate of return is to further increase the after-tax rate of return. The Machinery and Allied Products Institute has concluded that:

The gain from the initial writeoff, if it were made applicable to equipment without any dollar limitation, would increase the after-tax return by 6 to 8 per cent thereof for companies currently using either declining-balance or sum-of-digits depreciation, and by 8 to 10 per cent thereof for companies now employing straight line depreciation. Combined with the benefit of the new methods over the straight-line write off, the improvements of the after-tax return would be in the 15-25 per cent range.¹⁴

"Liberalized Depreciation," Capital
Formation, and Economic Growth

The importance of economic growth was emphasized in the recent report of the Commission on Money and Credit as follows:

Economic growth is a major American objective, not as an end in itself but because it is a means and a prerequisite for the attainment of economic and other fundamental goals. Economic growth makes it possible to improve the standards of living of our own and future generations and to help raise standards of living in other parts of the world. The dynamic adjustments required by technological advances are more easily made

in an expanding economy; competing demands for higher income can be more easily reconciled if total output is expanding. Finally growth provides the challenges and the sense of achievement that distinguish a growing society from a stagnant society.¹⁵

Some of the more important factors affecting economic growth are the quantity and quality of the labor force, the degree of education, capital formation, and technology. The relative importance of these factors depends to some extent upon the particular society and the stage of economic development of the society.

If "liberalized depreciation" affects economic growth, it does so mainly through its impact on investment expenditures. Therefore, in this section the relationship of capital formation to economic growth is discussed. After examining this relationship briefly the relationship of "liberalized depreciation" to capital formation is discussed.

Relationship of Capital Formation to Economic Growth.--

As suggested by Evsey Domar, "A thorough analysis of the economic aspects of capital accumulation is a tremendous job."¹⁶ The importance economists attribute to capital formation in the development of economic growth theories is noted in this section. According to many economists, capital formation plays a crucial role in the process of economic growth.¹⁷ Professor Benjamin Higgins has observed that capital formation is the core of economic development. He writes, "Whether in a predominantly private enterprise system like the American, or in a communistic system like the Russian or

Chinese, economic development cannot take place without capital accumulation."¹⁸

Within a national income framework, gross private domestic investment is a significant factor in the determination of gross national product. As brought out in Table 22, gross private domestic investment has constituted about 15 per cent of gross national product over the last ten years. The rate of net investment (or capital formation) would be much less. Based on an analysis of studies by Raymond W. Goldsmith and John Hendrick, Edward Denison has estimated that net private capital formation in the United States has been averaging between 4 to 6 per cent of gross national product in recent periods.¹⁹

Definition of Capital Formation. Although the concept of capital formation has traditionally been an important concept to the economist, its definition still remains a matter of some disagreement. Simon Kuznets, Erich Zimmerman, Theodore Schultz, and others define capital in a broad sense. Their definition views capital as embracing human resources as well as plant and equipment. As a point of departure so as to confine ourselves to the subject at hand the writer defines capital formation in a narrower sense, as suggested by Ragnar Nurkse. Nurkse writes:

The meaning of 'capital formation' is that society does not apply the whole of its current productive activity to the needs and desires of immediate consumption, but directs a part of it to the making of capital goods: tools and instruments, machines and transport facilities, plant and equipment - all the various forms of

TABLE 22

RELATIONSHIP OF GROSS PRIVATE DOMESTIC INVESTMENT TO
GROSS NATIONAL PRODUCT, ANNUALLY 1952-1961

	(Billions of Dollars)									
	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961
Gross National Product	347	365	363	397	419	443	445	484	503	519
Gross Private Domestic Investment	50	50	49	64	67	66	57	73	72	69
Ratio of Gross Private Domestic Investment to Gross National Product (Per Cent)	14	14	13	16	16	15	13	15	14	13

Source: U.S. Department of Commerce, Survey of Current Business (July, 1962), p. 6.

real capital that can so greatly increase the efficacy of productive effort.²⁰

Nurkse restricts his analysis to the accumulation of material capital. This is the definition the writer uses in this section.

The Nurkse Thesis. The core of the problem of the "vicious circle of poverty," popularized by Ragnar Nurkse, is capital formation. Low real income is a reflection of low productivity, which in turn is partly a reflection of the lack of capital formation.

To increase economic growth Nurkse suggests a "balanced growth" approach. By a more or less synchronized application of capital formation to a wide range of industries, economic growth may be stimulated and maintained. Nurkse recognizes the Schumpeterian theory of assigning a central role to the creative entrepreneur. He holds, however, that the "clustering of innovations" should not be restricted to a particular industry. "A wave of capital investments in a number of different industries - can economically succeed while any substantial application by an individual entrepreneur on any particular industry may be blocked or discouraged by the limitations of the pre-existing market."²¹

Capital formation will be more productive if applied through "balanced growth" according to the Nurkse thesis. Through "balanced growth" the market increases in size and individual investment incentives are stimulated. If considered in isolation, the prospective return might not be

sufficiently attractive to make capital formation worthwhile. Although much of Nurkse's analysis is directed towards underdeveloped countries, it has relevance for developed countries as well.

The Hirschman - Singer Thesis. Hans Singer and Albert Hirschman also attribute major emphasis to the role of capital formation in their theories of economic development.

Singer holds that the "balanced growth" thesis has relevance only for economies which have sufficient resources to proceed on all fronts. For underdeveloped economies he suggests a concentration of capital formation in certain industries in order to make the economic system more elastic. Singer holds that capital formation may be necessary in certain industries to correct existing imbalance among other industries.

Albert Hirschman goes further than Singer by recommending a deliberate unbalancing of capital formation to stimulate economic growth. He writes:

Development has of course proceeded in this way, with growth being communicated from the leading sectors of the economy to the followers, from one industry to another, from one firm to another. In other words, the balanced growth that is revealed by the two still photographs taken at two different points in time is the end result of a series of uneven advances of one sector followed by the catching up of other sectors. If the catching-up overreaches its goal, as it often does, then the stage is set for further advances elsewhere.²²

Hirschman emphasizes the need for a "big push" in strategically selected industries or sectors of the economy.

Economic development proceeds by directing capital formation into certain industries which in turn stimulates other industries. A case in point to support his position was the development of the railroad industry in the United States. By directing capital formation to the transportation industry other industries such as coal and steel were stimulated.

Although Singer-Hirschman and Nurkse disagree on the direction of capital formation efforts, they all emphasize the importance of the role of capital formation.

"Liberalized Depreciation" as a Stimulus for Capital Formation.--Several monetary and fiscal policy devices are available to stimulate investment expenditures in order to increase capital formation. One of the important fiscal policy devices is the offering of special tax advantages. The special tax advantage that this study is concerned with is "liberalized depreciation."

For several decades our government has offered special tax advantages in the form of "liberalized depreciation." These measures began in World War I with the issuance of "certificates of necessity" and continue in the present decade as exemplified by publication of new liberal depreciation guidelines in July, 1962.

It is difficult to quantify the relationship between "liberalized depreciation" and capital formation. Some economists suggest this is impossible. In the words of Norman B. Ture, "It is impossible to determine the extent to which the

increase (in investment) in 1955-1957 was the result of the availability of the liberalized depreciation allowances for tax purposes provided in the Internal Revenue Code of 1954."²³

On the other hand, some economists suggest that there is a relationship between "liberalized depreciation" and capital formation. For example, Alvin Hansen holds that "liberalized depreciation" affects capital formation. He writes:

I heartily agree that accelerated depreciation is a powerful and highly desirable method of stimulating investment. . . . the privilege of accelerated depreciation was one of the many factors that caused the abnormal spurt of investment in 1955-1957. . . .²⁴

In a recent publication the Committee for Economic Development also suggested that "liberalized depreciation" encourages capital formation. In discussing the 1954 accelerated depreciation methods the Committee observed, "Although it is impossible to measure the effect of these changes, we have little doubt that they contributed to the generally high level of private investment since 1954."²⁵ In this study the CED appears to be particularly impressed with the merits of "liberalized depreciation" as a tool to stimulate capital formation. The committee points to the practice of other countries (including West Germany, Sweden, United Kingdom, and France) concerning the use of more liberal depreciation allowances.

In the above study the CED concluded:

In view of the great importance of increasing our growth rate, an effort should be made to moderate the

effects of the high tax rates. The most direct method of accomplishing this objective is to permit taxpayers to write off the cost of investment at a faster rate (italics mine).²⁶

Professor Robert Eisner holds that many of the arguments advanced concerning the stimulation of capital formation through "liberalized depreciation" are irrelevant.²⁷ In discussing the argument that higher depreciation charges make more funds available for capital formation, he holds that there is little ground for arguing that the availability of funds determines their expenditure. He suggests that if investment opportunities are attractive, firms can generally raise the funds. If investment opportunities are not attractive firms will generally not invest in plant and equipment regardless of the availability of funds.

In discussing the argument that "liberalized depreciation" makes capital formation more attractive by increasing the aftertax rate of return (a tendency illustrated in this chapter) Professor Eisner points to the fallacy involved in the naive assumption that everything else can remain unchanged when "liberalized depreciation" is employed. He observes, however, that "liberalized depreciation" may increase the attractiveness of long-lived capital. He concludes that to the extent the economy adopts such longer lived capital - output ratio is likely to be higher and capital formation greater for purposes of replacement and expansion and to meet changes in product demand and factor supply.

Another economist, Professor E. Cary Brown has also directed much effort toward an examination of various incentives for stimulating capital formation. In discussing the contribution "liberalized depreciation" may make toward increasing capital formation, Professor Brown suggests that a merit of this investment stimulus device is that firms must maintain their current investment or lose the tax saving benefits of "liberalized depreciation." Firms will receive no extra reduction in income unless their current investment exceeds their normal depreciation.²⁸ In a recent paper Professor Brown concludes:

The experiment with and growth of investment-stimulating devices is a fascinating chapter in fiscal policy deserving detailed study. If economists are to be useful to those designing policy, it behooves us to press on with our study of investment decisions to give them breadth and depth comparable to our knowledge of consumer behavior.²⁹

Cash-Flow Depreciation. It would be possible to provide more "liberalized depreciation" to the extent of allowing lump sum write offs of investment in plant and equipment. Professor Joel Dean has referred to this possibility as "cash-flow" depreciation.³⁰ Many cash outlays which are really investments from an economic viewpoint, are afforded this treatment in present income tax laws. Cases in point are research and development costs. The availability of "cash flow" depreciation for some investments and not for others may serve as an incentive for firms to maximize expenditures subject to "cash flow" depreciation in order to minimize income tax

flows. Therefore, capital formation may be less than it would be if "cash flow" depreciation for capital equipment was allowable for income tax purposes.

Current Developments. There is much contemporary interest in the possibility of "liberalized depreciation" increasing capital formation. Concurrent with the release of the new liberal depreciation schedules in July, 1962, the President made the following comments:

The 'tax cut' these changes will make possible - the net reduction in tax liabilities -- will reach \$1 $\frac{1}{2}$ billion in the first year. . . . Business spokesmen who have long urged this step estimate that the stimulus to new investment (italics mine) will be far greater -- perhaps as much as four times greater -- than the \$1.5 billion made available. In any event, it is clear that at least an equal amount will go into new income -- producing investment and eventually return to the Government in tax revenues most, if not all, of the initial costs.³¹

The above comments suggest that a major consideration in the promulgation of more liberal depreciation was to increase capital formation. A stated consideration in the promulgation of the major "liberalized depreciation" methods authorized in the 1954 Internal Revenue Code was also to offer an incentive to invest in plant and equipment. To the extent that the "liberalized depreciation" methods have stimulated capital formation, the new depreciation schedules should also. The fact that the business firm may combine the features of shorter useful lives (authorized by the new depreciation schedules) with the "liberalized depreciation" methods will increase the amount of tax deferral.

In its economic forecast for 1963, however, the Prudential Insurance Company holds that "liberalized depreciation" will have only a "slight effect" on investment in plant and equipment. It contends that much of this country's productive capacity is obsolete; that there is a gap between our productive capacity and actual demand. Its position is as follows:

Despite liberalized depreciation allowances and tax credits on new equipment, there will be no major upsurge in business capital spending . . . reason: the present under-utilization of capacity . . . 1963 outlays will be unchanged at \$50 billion, mostly for modernization . . .⁵²

The above references indicate there is much discussion concerning the impact of "liberalized depreciation" on investment expenditures. However, empirical bases for these discussions are non-existent. The writer has searched diligently in an attempt to present a direct relationship between "liberalized depreciation" and investment in plant and equipment. He has also personally interviewed and corresponded with economists and government officials who have devoted much of their time to this area. These efforts have not produced any empirical evidence one way or the other.

Summary

It is difficult to quantify the impact of depreciation on investment decisions because economists and accountants know very little about how investment decisions are made. The approach used was to evaluate the effect of

"liberalized depreciation" on traditional "tools" for evaluating alternative investment proposals.

The time discount gain feature of "liberalized depreciation" was discussed and illustrated in the first section. The main conclusion was that the optimum depreciation method is the one that yields the greatest present value. Since the "liberalized depreciation" methods yield considerably higher values than straight line depreciation, use of the liberalized methods is desirable from the viewpoint of the individual firm.

The possibility that "liberalized depreciation" may serve as an investment stimulus by increasing the availability of financial resources was examined. The common misconception that advantages gained by employing "liberalized depreciation" in the early years of an asset's life are lost in later years was discussed. Payback period analysis was presented, following the discussion of the availability of financial resources. This analysis is sometimes employed as a point of origin for more refined methods of evaluating alternative investment proposals. The payback period can be altered by the use of "liberalized depreciation," dependent on what year of the asset's life payback is computed.

Three rate of return methods were discussed. An attempt was made to evaluate the impact of employing "liberalized depreciation" on the rate of return. Results of the "unadjusted rate of return" method were discounted, due to

lack of realism associated with the method. The "discounted cash flow" rate of return methods indicate that "liberalized depreciation" contributes to providing a higher rate of return by decreasing income tax flows. Since the Small Revision Act of 1958 provided depreciation in addition to normal depreciation, its effect is to complement the "liberalized depreciation" methods, thereby increasing the after tax rate of return.

The last part of the chapter was devoted to discussing the possibility that "liberalized depreciation" may have implications for the economy through its effect on economic growth. Specific growth theories discussed were the Nurkse "balanced growth" thesis and the Hirschman - Singer thesis. The Nurkse thesis holds that economic development may best be achieved through directing capital formation into various industries so they can move forward together. In this manner they will reinforce each other in the sense of generating external economies. The Hirschman - Singer thesis holds that it is not desirable to spread capital formation efforts extensively. They suggest that some sectors of the economy should be stimulated more than others. This "overshooting" process will result in causing other sectors to attempt to "catch up," which will create a favorable climate for economic development. Although the above theses disagree as to the direction of capital formation efforts, both emphasize the importance of capital formation.

There is much discussion and little agreement concerning the relationship of "liberalized depreciation" to capital formation. Professor Alvin Hansen and others are impressed with the merits of "liberalized depreciation" as an investment stimulus device. Professor Robert Eisner and others are less impressed with this investment stimulus device. A stated purpose of the promulgation of new liberal depreciation guidelines in July, 1962 was to stimulate investment in plant and equipment. Some hold this purpose will not be served. For example, in its economic forecast for 1963 the Prudential Insurance Company holds that the new guidelines will not increase investment expenditures because of the present under-utilization of plant capacity. The writer could find no empirical evidence to support the thesis that "liberalized depreciation" increases investment expenditures.

FOOTNOTES

¹ Sidney Davidson, Tax Revision Compendium, Committee on Ways and Means, Volume II (Washington: U.S. Government Printing Office, 1959), p. 810.

² Sidney Davidson and David F. Drake, "Capital Budgeting and the 'Best' Tax Depreciation Method," The Journal of Business of the University of Chicago, Volume XXXIV (October, 1961), p. 446, Table 3.

³ Ibid., pp. 447-449.

⁴ Richard Goode, "Accelerated Depreciation Allowances as a Stimulus to Investment," Quarterly Journal of Economics, Volume LXIX (1955), p. 195.

⁵ Ibid., p. 200.

⁶ George Terborgh, Tax Revision Compendium, Committee on Ways and Means, Volume II (Washington: U.S. Government Printing Office, 1959), p. 857.

⁷ Evsey Domar illustrates this point in his "The Case for Accelerated Depreciation," Quarterly Journal of Economics, Volume LXVII (1953), pp. 493-519.

⁸ Goode, op. cit., p. 196.

⁹ Terborgh, op. cit., p. 859.

¹⁰ Letter from Dr. Robert Eisner, Professor of Economics, Northwestern University, May 24, 1962.

¹¹ J. Fred Weston, Tax Revision Compendium, Committee on Ways and Means, Volume II (Washington: U.S. Government Printing Office, 1959), p. 801.

¹² This problem may be solved algebraically by using the following formula:

$$C = \sum_{t=1}^n \left(\frac{R}{(1+k)^t} \right)$$

¹³ Since the order of profitability within both the accepted and rejected groups of investment proposals may vary between the "rate of return variant" and the "present-worth index variant," some further possibilities exist for

exploration of the possible differential effects of "liberalized depreciation" upon the investment decision. This refinement, however, is beyond the scope of the present study.

¹⁴Machinery and Allied Products Institute, Effect of New Initial Writeoff on Business Investment (Washington: Machinery and Allied Products Institute, 1958).

¹⁵Report of the Commission on Money and Credit, Money and Credit (New Jersey: Prentice Hall, Inc., 1961), p. 30.

¹⁶Evsey D. Domar, Essays in the Theory of Economic Growth (New York: Oxford University Press, 1957), p. 70.

¹⁷Among the economists stressing the importance of capital formation to economic development are: Ragnar Nurkse, Roy Harrod, Evsey Domar, Albert Hirschman, and Paul Sweezy.

¹⁸Benjamin Higgins, Economic Development - Problems, Principles, and Policies (New York: W.W. Norton and Company, Inc., 1959), p. 204.

¹⁹Edward F. Denison, The Sources of Economic Growth in the United States and the Alternatives Before Us, Supplementary Paper No. 13 (New York: Committee for Economic Development, 1962), p. 114.

²⁰Ragnar Nurkse, Problems of Capital Formation in Underdeveloped Countries (Oxford: Basil Blackwell, 1957), p. 2.

²¹Ibid., p. 13.

²²Albert O. Hirschman, The Strategy of Economic Development (Connecticut: Yale University Press, 1958), p. 63.

²³Norman B. Ture, Joint Economic Committee, The Federal Revenue System: Facts and Problems 1961 (Washington: U.S. Government Printing Office, 1961), p. 78.

²⁴Alvin H. Hansen, Economic Issues of the 1960's (New York: McGraw-Hill Book Company, Inc., 1960), p. 34.

²⁵Committee for Economic Development, Growth and Taxes - Steps for 1961 (New York: Committee for Economic Development, 1961), p. 18.

²⁶Ibid., p. 15.

²⁷Robert Eisner, Tax Revision Compendium, Committee on Ways and Means, Volume II (Washington: U.S. Government Printing Office, 1959), p. 795.

²⁸This feature of "liberalized depreciation" was examined earlier in this chapter in Table 16.

²⁹E. Cary Brown, "Tax Incentives for Investment," Paper written by E. Cary Brown, Professor of Economics, Massachusetts Institute of Technology, p. 11.

³⁰Joel Dean, Tax Revision Compendium, Committee on Ways and Means, Volume II (Washington: U.S. Government Printing Office, 1959), p. 813.

³¹Committee on Ways and Means, Depreciation Guidelines and Rules, "Revenue Procedure 6-21," (Washington: U.S. Government Printing Office, 1962).

³²Prudential Insurance Company of America, Economic Forecast - 1963 (Twelfth Annual Edition) (Texas: Prudential Press, 1962), p. 4.

CHAPTER V

IMPACT OF "LIBERALIZED DEPRECIATION" ON MANAGERIAL DECISIONS

Depreciation, particularly "liberalized depreciation," affects important managerial decisions. Specific areas examined in this chapter will be the relationship of "liberalized depreciation" to product pricing, dividend policy, and wage negotiations. Since financial planning is facilitated by analyzing financial statements, the effect of "liberalized depreciation" on the analysis of financial statements will also be explored.

Depreciation affects decisions through its impact on reported profits. Depreciation may constitute a significant portion of the operating costs of the firm. By employing "liberalized depreciation," the ratio of depreciation to profits increases over what the ratio would be by employing straight line depreciation. The relationship of depreciation to profits is illustrated in Table 23. The firms in the table are large corporations. They were selected not because they are necessarily representative of the universe, but because of the availability of data. It should be noted that

TABLE 23
 RELATIONSHIP OF DEPRECIATION TO NET INCOME OF TEN
 CORPORATIONS IN THE UNITED STATES, 1961 . .

Corporation	Net Income (Millions)	Depreciation (Millions)	Ratio of Depreciation to Net Income
Bristol-Myers Co.	\$ 13.0	\$ 2.3	17.7
Colgate Palmolive Co.	22.2	12.6	56.8
Ford Motor Co.	409.6	210.5	51.4
General Electric	242.0	117.9	48.7
General Motors	892.8	408.5	45.8
Jones and Laughlin Steel Corp.	32.1	49.9	155.5
Lehigh Portland Cement Co.	4.6	12.7	276.1
Masonite Corp.	3.6	4.4	122.2
Standard Oil Co. of California	294.4	166.1	56.4
U.S. Steel	190.2	210.5	110.7

Sources: Annual financial reports.

some large firms (e.g. several of the grocery chain stores) engage in purchase and lease back arrangements; therefore, they have most of their investment in inventory, as opposed to plant and equipment. In the illustrations in this chapter the writer assumes that the firm has a substantial investment in plant and equipment in relationship to its investment in other assets. The relationship of depreciation to product pricing is examined first.

Product Pricing

Cost finding and price determination are commonly associated in managerial activity. In fact, many economists and accountants suggest that the latter is dependent upon the former. Other economists belittle the role of costs in pricing the products of a firm. There seems to be much debate and little agreement concerning how price is actually determined, as the following reference suggests:

Pricing is a complex subject. It is not a one-man or a one-activity job. Pricing theorists and practitioners differ on various pricing theories. In practice, the solution of a pricing problem becomes a research job which requires the cooperation and coordination of the economist, statistician, market specialist, industrial engineer, and cost accountant. Since the determination of a sales price requires consideration of many factors, some of which defy measurement or control, prudent and practical judgment is necessary.

The Austrian or "marginal utility" school held that price was determined by demand. The Manchester or "cost of production" school held that price was determined by supply. Later, the Marshallian synthesis suggested that both demand

and supply entered into the determination of prices. Alfred Marshall made the astute observation that it is impossible to determine which blade of a pair of scissors does the cutting. Marshall's analysis provided a framework for examining demand and supply relationships for competitive and monopolistic markets. Later, E.H. Chamberlin, and others, added models for monopolistic competition and oligopoly. Thus, the traditional economic pricing theories were developed.

According to the traditional theories of micro economists, the firm will maximize its profits by pricing at the point where marginal costs equal marginal revenue. The theory presupposes the ability to measure marginal revenue and marginal costs cardinally. "Many observers claim that modern business firms--even the largest--cannot in real life accurately determine marginal revenue and marginal cost."² If one abandons the marginal cost-revenue theory, he is left with some type of cost-plus pricing policy. Professor Neil W. Chamberlain suggests that a cost-plus approach to the determination of pricing is becoming more and more accepted by management. He writes:

The policy which seems to characterize more managements than does any other policy is that prices should bear some 'equitable' relation to costs. . . . 'Fair trade' pricing is based on a philosophy that sales at less than cost plus a fair profit are injurious to 'honest' merchants.³

Although lacking in universal applicability, cost-plus pricing is a useful point of departure for analyzing the effects of "liberalized depreciation" as a cost of doing

business. In the case of cost-plus pricing, the magnitude of the depreciation charge directly affects price determination. Contemporary variations of cost-plus pricing will be discussed. An assumption that the demand for the firms product is inelastic is made by the writer.

It is necessary to distinguish between short run and long run effects. Higher depreciation charges made available by employing "liberalized depreciation" may be offset in later years by smaller depreciation charges for firms that are not continually expanding. For growing firms, however, higher depreciation charges tend to be permanent.⁴ This tendency is relevant for all the cost-plus pricing policies discussed in this chapter.

Gross-Margin Pricing.--Gross-margin pricing consists essentially of applying a standard markup to the cost of goods sold. The cost of goods sold will be either the purchase price of goods acquired for resale or the total of direct costs involved in producing a good or service. In the firm that acquires goods for resale (hereafter referred to as a trading firm) the cost of goods sold does not include a charge for depreciation or other overhead costs. For the firm that manufactures goods for resale (hereafter referred to as a manufacturing firm), however, the direct costs are direct labor, raw materials, and an allocable portion of overhead costs. Depreciation of plant and equipment are included in overhead costs.

The above might imply that "liberalized depreciation" would not affect the pricing policy of a trading firm following a gross-margin pricing policy, but would affect the pricing policy of a manufacturing firm. However, both trading and manufacturing firms incur operating costs. Many of these costs are offset by their contribution to revenue, such as depreciation of office equipment and depreciation of other facilities not directly related to the production process. Also, in terms of opportunity costs the purchase price of goods for a trading concern includes the cost of raw materials, direct labor, and overhead (including depreciation) that would have been spent if the firm had manufactured the goods for resale in lieu of purchasing them. These characteristics are brought out in Table 24.

In gross-margin pricing the markup is set at a level which is expected to cover period, as well as product, costs. Depreciation could be both an overhead charge (product cost) and an operating expense (period cost). Therefore, depreciation would be considered in the determination of the markup.

"Liberalized depreciation" increases product and period costs over what these costs would be if straight line depreciation is used. Therefore, "liberalized depreciation" increases the price of goods sold by a firm using a gross-margin pricing policy. The amount of the increase depends on the investment in plant and equipment and the degree of "liberalized depreciation."

TABLE 24

COMPARISON OF INCOME STATEMENTS FOR A TRADING FIRM AND A MANUFACTURING FIRM

	Manufacturing Firm	Trading Firm
Net Sales	\$ 100,000	\$ 100,000
Cost of Goods Sold:		
Beginning Inventory ^a	\$ 40,000	\$ 40,000
Net Purchases		45,000
(Raw Materials Used)	20,000	
(Direct Labor)	15,000	
(Manufacturing Overhead) ^b	10,000	
Total Available for Sale	\$ 85,000	\$ 85,000
Ending Inventory ^a	25,000	25,000
Cost of Goods Sold	60,000	60,000
Gross Profit	40,000	40,000
Sales and Administrative Expenses ^b	20,000	20,000
Net Income	\$ 20,000	\$ 20,000

^aRepresents goods in process and finished goods inventory for the manufacturing firm.

^bIncludes depreciation.

Conversion Cost Pricing.--Conversion cost pricing consists essentially of directing sales efforts to those products that require the least amount of conversion costs to produce. Conversion cost is a combination of direct labor and factory overhead. The elements of manufacturing costs are raw materials, direct labor, and overhead. In essence, the raw materials are converted to finished products by the addition of direct labor and overhead.

The manufacturing costs of two types of firms are illustrated in Table 25. The cost break down indicates that product A requires only half as much direct labor and overhead as product B, although total manufacturing costs for the two products are identical. If it were possible to shift the direct labor and overhead efforts from product B to A, a greater number of units would be sold and the same rate of return per unit could be retained. This discussion disregards the possibility that increased production of product A might result in a drop in price by disturbing the market equilibrium.

In conversion pricing the selling price is established at a point high enough to cover manufacturing costs, selling and administrative costs, and to provide for profit. Conversion from product A to product B would not increase total overhead or selling and administrative costs. Therefore, total depreciation charges should be the same, regardless of the mix between products A and B. However, if

TABLE 25
COMPARISON OF MANUFACTURING COSTS FOR TWO PRODUCTS

Elements of Cost	Product A	Product B
Raw Materials	\$ 12	\$ 6
Direct Labor	4	8
Factory Overhead	2	4
Total Manufacturing Costs	\$ 18	\$ 18
Selling Price	20	20
Profit before Selling and Administrative Expenses	\$ 2	\$ 2

"liberalized depreciation" is used in lieu of straight-line depreciation, factory overhead (and possibly selling and administrative costs) would increase. This will result in a reduction of the profit of the firm or an increase in the sale price.

Rate of Return Pricing.---Rate of return pricing consists of developing a price that will yield the desired rate of return on capital. As is true with other cost-plus pricing policies, this method is based on a percentage markup over cost. The formula for rate of return pricing is:⁵

$$\frac{\text{Capital Employed}}{\text{Total Annual Costs}} \times \text{Desired Rate of Return} = \text{Percentage Markup on Cost}$$

Assuming capital employed of \$40,000,000, total annual costs of \$10,000,000, and a desired rate of return of 20 per cent, the markup on cost would be 80 per cent.

$$\frac{\$40,000,000}{10,000,000} \times 20\% = 80\%$$

After determining the percentage markup on cost, the markup is multiplied by total annual costs which gives the markup in terms of dollars. Price is determined by adding total costs and markup. The computations follow:

$$\begin{array}{l} .80 \text{ (Percentage Markup)} \times \$10,000,000 \text{ (Total Annual Costs)} = \$8,000,000 \text{ (Markup)} \\ \\ \$10,000,000 \text{ (Total Annual Costs)} + \$8,000,000 \text{ (Markup)} = \$18,000,000 \text{ (Sales Price)} \end{array}$$

By varying the parameters employed in the above formula, the effect of a change on sales price may be determined. For example, employing "liberalized depreciation" will, ceteris paribus, increase total annual costs. The increase in total annual costs will decrease the percentage markup. However, the smaller percentage markup will be applied to a larger, base (new total annual costs) which will result in an increase in the sales price. Assuming an increase of \$2,500,000 in total annual costs as a result of using "liberalized depreciation" and holding other parameters constant, an example of the impact of employing "liberalized depreciation" in pricing policy follows:

$$\frac{\$40,000,000 \text{ (Capital Employed)}}{\$10,000,000 + \$2,500,000 \text{ (New Total Annual Costs)}} \times$$

$$20\% \text{ (Desired Rate of Return)} = .64 \text{ (Percentage Markup)}$$

$$\begin{array}{rcl} .64 & \times & \$10,000,000 \\ \text{(Percentage Markup)} & \times & \text{(New Total Annual Capital)} \end{array} + \$2,500,000 = \$8,000,000 = \text{(Markup)}$$

$$\begin{array}{rcl} \$10,000,000 + \$2,500,000 & + & \$8,000,000 \\ \text{(New Total Annual Capital)} & + & \text{(Markup)} \end{array} = \$20,500,000 = \text{Sales Price}$$

Pricing policies based on the rate of return method are much more complicated than the above illustrations might suggest. For example, as costs increase (such as occur as a result of using "liberalized depreciation") capital may also be affected which in turn will affect the percentage markup. Also, the desired rate of return may change as a result of

increases in total annual costs. Nevertheless, "A company's pricing decision based on the rate of return on capital employed, standard costs, and estimated plant capacity offers management one of the most advanced methods for control and analysis."⁶

Flexible Mark-Up Pricing.--Professor Neil W. Chamberlain has developed an additional cost-plus pricing policy which he has termed the flexible mark up. He suggests that gross-margin, conversion cost, and rate of return pricing policies by themselves fail to explain price determination. He agrees that costs are generally considered to be the starting point for price determination, but holds that quantitative analysis must be supplemented by other considerations such as the ones listed below:⁷

1. Cost advantages or disadvantages over competitors.
2. The strength of the desire to expand market share in a given product line.
3. Competitive prices.
4. Estimates of consumer response.
5. The possibility of segmenting markets for "preferential" or "discriminatory" pricing.

Because of the above factors and others, some economists have discounted the importance of formula pricing. However, most managerial decisions are dependent upon both quantitative and non-quantitative analysis. Pricing policy decisions are no exceptions. The weight given to quantitative and non-quantitative factors varies from situation to

situation and from firm to firm. Nevertheless, it seems reasonable to conclude that cost-plus pricing policies are employed widely by management. To the extent that these policies are followed, price may be affected by employing "liberalized depreciation."

Dividend Policy

The distribution of dividends is a managerial decision dependent to a large extent on profits. An important correlative consideration is the determination of how much of the firm's profits should be retained in the business. This section is devoted to examining the relationship of dividend policy to income and exploring briefly factors that restrict the distributions of retained earnings of the firm. A major consideration in formulating dividend policy seems to be the desire on the part of management to achieve dividend stability.

Dividend Stability.--Professor John Lintner has undertaken several empirical studies dealing with corporate dividend policy. These studies were made at the Harvard Business School under a grant from the Rockefeller Foundation. The most significant conclusion of these studies was that management placed major emphasis on dividend stability in formulating dividend policy.

In one study dealing with a diverse group of 28 companies Professor Lintner concluded, "With the possible exception of 2 companies which sought a relatively fixed

percentage pay-out, consideration of what dividends should be paid at any given time turned, first and foremost in every case, on the question whether the existing rate of payment should be changed."⁸ In another study which dealt with 196 company-years of dividend action (28 companies, seven years, 1947-1953), Professor Lintner concluded, ". . . we found no instance in which the question of how much should be paid in a given quarter or year was considered without regard to the existing rate as an optimum problem in terms of the interests of the company."⁹

These studies suggest that the elements of inertia and conservatism are important in formulating dividend policy. Management appears to be deeply ingrained with the belief that most stockholders prefer a reasonably stable dividend policy varied with current profits.

Professor Lintner's studies also indicate that there is a relationship, however, between current earnings and the existing dividend rate. This relationship most commonly is in the form of some predetermined target pay-out ratio. The existence of a target rate does not necessarily imply that the firm automatically distributes an exact proportion of earnings. It serves, instead, as a guideline for management to correlate dividend policy with earnings over the years. If a change in the earnings trend becomes evident, the movement toward lower or higher dividends rates would probably be a slow movement, not a radical change. More important than

correlating dividend distributions with current earnings on an annual basis is the correlating of dividend distributions with earnings over some stated period of years.

The two most important considerations in formulating and administering dividend policy are dividend stability and a correlation of dividend distributions with earnings. Probably more weight is attached to the first consideration, while earnings serve to set limits on dividend distributions over the long run. Earnings are significant in the determination of dividend policy. "Over the years, American corporations have, in the aggregate, tended to pay out in the form of dividends between 55 and 60 per cent of net income."¹⁰

A significant determinant of net income for many firms is depreciation. Higher depreciation charges reduce reported profits. Since profits tend to set the limits on dividend distribution in the long run, "liberalized depreciation" may directly affect dividend policy. This is particularly true for expanding firms which consistently employ "liberalized depreciation." Closely related to this point is the contribution of "liberalized depreciation" to providing funds for dividend payments and financing expansion of plant and equipment through retention of retained earnings. This feature of "liberalized depreciation" will be discussed in the next section.

Restrictions of Retained Earnings.--Accumulated earnings are the primary source of dividend distributions.

Confusion may arise because of the statement that dividends are paid out of accumulated earnings. Dividends are paid in stock, cash, or property. However, whatever the form, dividends are normally charged to accumulated earnings when the dividends are declared. The statutes of 47 states and the District of Columbia expressly authorize dividend distributions to be charged to accumulated earnings.¹¹ In the other 3 states the law is less specific and allows the board of directors a large degree of discretion in the determination of the legal sources of dividend distributions.¹² Although 39 states establish contributed capital as a legal source of dividend distributions to preferred stockholders, only 28 of these allow contributed capital to be distributed to common stockholders as dividends. The Securities and Exchange has long frowned on the use of any form of contributed capital as a dividend source when the corporation has a retained earnings balance. The American Bar Association has included a provision requiring the prior use of retained earnings as a dividend source in its Model Business Corporation Act.¹³

The amount of retained earnings of a firm generally sets a limit on dividend distributions. The mere fact that a firm has retained earnings doesn't necessarily mean that the firm is financially able to distribute all, or any portion, of the retained earnings.

There are three major classifications of restrictions that are placed on retained earnings. These restrictions are

sometimes called appropriations. They are:

- (1) Appropriations to report legal restrictions on the use of retained earnings.
- (2) Appropriations to report contractual restrictions on the use of retained earnings.
- (3) Appropriations to report discretionary action by the board of directors in the presentation of retained earnings.¹⁴

An example of a legal restriction on retained earnings is the appropriation of retained earnings in conjunction with the purchase of treasury stock. This restriction helps to insure that the legal capital of the corporation will not be impaired.

Examples of contractual restrictions on retained earnings are appropriations for retirement of bonded indebtedness, appropriations for the redemption of preferred stock, and appropriations for preferred stock or bond redemption funds. These restrictions help to insure that cash resources will not be distributed in cash dividend payments and thus will be available to retire preferred stock on bonds. Another example of contractual obligations is the common provision in term loans that capital expenditures are limited to the amount of accumulated depreciation. Examples of discretionary restrictions on retained earnings are appropriations to provide for contingencies, self-insurance, working capital, or replacement and expansion of plant and equipment.

Many economists and accountants have suggested that replacement and expansion of plant and equipment are

accomplished internally either through retained earnings or through depreciation allowances. Depreciation allowances can not replace plant and equipment. The recording of depreciation, particularly "liberalized depreciation" reduces reported profits and decreases cash flows for income taxes. However, unless the money saved is set aside in a fund for replacement of plant and equipment, it may be employed in other ways and may not be available for replacement or expansion when needed. Retained earnings, however, may be a major source of replacement or expansion of plant and equipment. This restriction on retained earnings may be a major factor in the formulation of dividend policy.

In summary, the major source for dividend distributions is the retained earnings of the firm. There may be several restrictions on retained earnings in the form of legal appropriations, contractual appropriations, and discretionary appropriations. All of the appropriations plus the current earnings and the desire to achieve dividend stability are major considerations in formulating and implementing dividend policy. "Liberalized depreciation" affects dividend policy through its impact on earnings and its relationship to minimizing cash out-flows for income taxes. By minimizing cash out-flows, more cash is made available to pay dividends if management so wishes.

Wage Negotiations

The accountant's role in wage negotiations is one of

preparing and analyzing relevant financial data. The relevance of particular financial data may vary from case to case, but in general the data that are germane consist of estimating the firm's "ability to pay." Unless financial data of management are made available to unions, they would rely primarily on data from published financial reports and would, therefore, be estimating the firm's ability to pay in terms of past profits. Management, on the other hand, equipped with data which probably would not be published, tends to estimate the ability of the firm to pay in terms of future profits. This may result in a significant difference in the estimates.

Financial data may be used to obtain public, as well as employee and union support. Collective bargaining is becoming more public and less private in contemporary society. There has been increasing government intervention in wage negotiations through the use of fact-finding boards. These boards, at times, rely heavily on the use of financial data of the firm.

This section is devoted to examining the role of accounting in wage negotiations with specific reference to the impact "liberalized depreciation" may have on wage negotiations through its impact on reported profits.

Criteria for Disclosure.--The accountant may be called upon to analyze the nature of the request for financial data. The decision to disclose financial data can be

approached by appraising the reasonableness of the request.¹⁵ The accountant should be well equipped to advise management on the propriety and fairness of furnishing financial data. For example, the accountant should advise management of the possible inferences that may be drawn by furnishing partial data. Specific requests for financial data may lead to undesirable results by the use of selected bits of data out of context.

Reasonable Requests. Requests for financial data appear to be "reasonable" if the data are already available to outsiders in the form of annual reports, available from the Securities and Exchange Commission, or from investment firms.

Another basis for a "reasonable request" might be that the data would advance the mutual objectives of both management and labor. The data might aid materially in reconciling areas of dispute.

It may be necessary to furnish financial data as a result of a ruling by the National Labor Relations Board. This Board has been active in the area of wage negotiations dealing with disputes over "ability to pay."

In the case of National Labor Relations Board v. Truitt Manufacturing Company, 1946, the National Labor Relations Board held that the employer violated Section 8(a)5 of the Labor Management Relations Act (refusal to bargain clause) by refusing to produce information to substantiate its claim of inability to pay. Relying heavily on prior court

decisions, the United States Court of Appeals reversed the ruling of the National Labor Relations Board and held that the employer did not have to render financial data to the union. The Supreme Court supported the ruling of the National Labor Relations Board and reversed the United States Court of Appeals decision. In rendering its decision the Supreme Court stated:

Good-faith bargaining necessarily requires that claims made by either bargainer should be honest claims. This is true about an asserted inability to pay an increase in wages. If such an argument is important enough to present in the give and take of bargaining, it is important enough to require some sort of proof of its accuracy.¹⁶

The Supreme Court observed that each case must stand upon its particular facts. The degree of financial detail the employer must furnish will vary in different situations, but in general the employer is required to furnish financial data relevant to the negotiations.

It may also be reasonable, and also prove prudent, for the accountant to furnish definitions of accounting and financial terms and to present analyses of interrelationships between various accounts. There may be a lack of mutual understanding concerning the function of depreciation, for example, and its relationship to the financial statements.

Unreasonable Requests. Requests for financial data appear to be "unreasonable" if the granting of the requests would damage the company such as affecting the firm's competitive position.

In the case of International Woodworkers v. National Labor Relations Board, 1959, the United States Court of Appeals noted that the information requested by unions for purposes of negotiation falls into two categories:

- (1) Data relating to wages paid to its employees.
- (2) Data relating to production and sales of the company.¹⁷

The Board contended that the employer violated Section 8(a)5 of the Labor Management Relations Act by refusing to supply information relating to wages, but dismissed the complaint in so far as it concerned the refusal to supply production and sales information. In supporting the position of the National Labor Relations Board the United States Court of Appeals cited the Truitt case ruling that "each case must stand upon its particular facts." An important consideration in this case was the detrimental effect that the release of sales and production information might have on the competitive position of the employer.

Detailed information concerning break even points and other managerial cost data (such as standard costs) are prepared primarily for management to facilitate planning and control. Release of these data for use in wage negotiations could prove injurious to the welfare of both the firm and its employees.

Unions appear to watch closely the portion of profits that are allocated to management for compensation. For

example, "a union local annually varies its wage demand in accordance with the number of weeks which top management spends in Florida, and in a printing plant wage demands vary according to the number of hours of work top management puts in daily."¹⁸ Such requests by unions appear unreasonable from the viewpoint of the firm as the union is normally not in a position to evaluate the contribution of management to the progress of the firm.

Questions concerning the sources and uses of funds, price determination, the role of technology, detail concerning research and development expenditures, and other requests of this nature may prove to be "unreasonable" in terms of the relationship of these data to wage negotiations.

The Independent Accountant.--An independent accountant who has undergone extensive training in the areas of cost accounting, accounting theory, and taxation should be equipped to contribute to wage negotiations. Accountants in the employ of management and the union may possess the necessary skill to contribute to wage negotiations but their lack of objectivity may preclude fruitful analysis. The independent accountant could serve wage negotiations in much the same way that an independent auditor examines and certifies as to the authenticity of a firm's financial statements.

There may be a problem of communication between the union and management concerning financial data that are relevant to wage negotiations. An independent accountant,

appointed jointly by labor and management, may serve as an intermediary to analyze and interpret relevant financial data.

The courts appear to recognize the merits of having an independent accountant participate in wage negotiations. In the case of Yakima Frozen Foods v. Local 760, Fruit and Vegetable Packers' and Warehousemens' Union, 1961, the employer refused to permit the union to make a general inspection of its books and records to substantiate the employer's claimed financial inability to meet union demands. The employer insisted instead that its books and records be audited, at the union's expense, by qualified accountants appointed by the union. The employer further stipulated that the accountant could not be in the union's general employ.

The employer contended that opening the books to the union might disclose his sources of supply to the union and his consignees and might result in secondary boycotts. The employer stated that an independent accountant would not disclose such confidential information. The National Labor Relations Board held that the employer was not guilty of refusal to bargain with the union. The Board noted that:

- (1) The employer's offer was reasonable.
- (2) The conditions imposed by the employer were not burdensome or restrictive on the union.¹⁹

An important area of dispute dealing with the ability of the firm to pay is the lack of agreement concerning the function of depreciation.

In the steel strike of 1959 an important element in dispute was the significance of the impact of "liberalized depreciation" on reported steel company profits. The industry contended that profits were overstated because of the way depreciation was figured and labor contended that profits were understated because of using "liberalized depreciation."

The industry's contention was that under conventional accounting, depreciation is calculated based on original dollar cost, and that this is inadequate because it fails to give effect to the tremendous change that has taken place in the purchasing power of the dollar, as a result of which it would cost many more dollars today to replace the plant than were originally spent. The industry maintains that realistic profits should be figured by reference to replacement figures. On that basis, the industry's profits are one-half of what the financial statements show.²⁰

Labor, on the other hand, contended that the function of depreciation is to allocate the original cost of an asset over its useful life. Labor officials observed that:

The companies have been following the tax laws in the way they write off depreciation, and the tax laws have allowed a higher write off to be bunched in early years ("liberalized depreciation") and counterbalanced by a lower write off in later years. The figures presented by the steel industry cover the earlier years where there is the higher write off. The labor people say that the depreciation amounts should be reduced by this excess write off in the early years. Reducing the depreciation would result in an increase in profits.²¹

Management may view depreciation as primarily a means of reducing reported profits to minimize cash income tax flows. To the extent that this is true, it appears desirable for management to capitalize on this feature of depreciation by employing "liberalized depreciation."

Management may also use "liberalized depreciation" for financial reporting. Although this position is subject to some question, management may hold that depreciation charges should be related to the cost of replacement of plant and equipment.²² Since replacement of plant and equipment will generally require more funds than the original plant and equipment, management may contend that "liberalized depreciation" should be used in financial, as well as income tax, reporting. Labor, on the other hand may view "liberalized depreciation" as an attempt on the part of management to report lower profits than the firm is actually making to strengthen the contention of management that the firm does not have "the ability to pay." Labor may recognize and agree with management that the firm should use "liberalized depreciation" for tax reporting but may hold that straight line depreciation should be used for financial reports.

The independent accountant can understand both positions. His ability to comprehend basic accounting principles, to apply them to problem areas such as depreciation, and his objectivity suggest that the independent accountant is uniquely equipped to make a fruitful contribution to wage negotiations.

Analysis of Financial Statements

By definition, accounting involves the analysis and interpretation of financial data. It is not enough to merely prepare financial statements. This section is devoted to

discussing impact of "liberalized depreciation" on the two traditional financial statements; the income statement and the balance sheet.

Comparative Financial Statements.--Financial statements prepared to summarize the economic activity for one period of time do not give an indication of the direction of change. Very significant is the change over the preceding year or years. The American Institute of Certified Public Accountants has recommended the presentation of comparative financial statements in conjunction with the presentation of annual financial reports.

The presentation of comparative financial statements in annual and other reports enhances the usefulness of such reports and brings out more clearly the nature and trends of current changes affecting the enterprise. Such presentation emphasizes the fact that statements for a series of periods are far more significant than those for a single period and that the accounts for one period are but an instalment of what is essentially a continuous history.²³

Any changes in reporting that have occurred that affect the comparability of financial statements should be disclosed, as suggested below:

It is necessary that prior-year figures shown for comparative purposes be in fact comparable with those shown for the most recent period, or that any exceptions to comparability be clearly brought out.²⁴

An important change in reporting that precludes comparative analysis and therefore requires an explanatory note would be conversion from straight line to "liberalized depreciation" or from "liberalized depreciation" to straight line depreciation. Once a particular method is selected

for income tax reporting, the method must be consistently employed for a particular asset or group of assets (with the exception of the declining balance--straight line switch-over). However, a new election may be exercised on assets acquired for expansion or replacement. An expanding firm is continually adding to plant and equipment. Therefore, this change in depreciation method is a practical possibility. Accordingly, business firms changing depreciation methods should disclose the change so that the accountant may adjust for the change when interpreting comparative financial data.

Since some firms use "liberalized depreciation" for income tax reporting and straight line depreciation for financial reporting, care must be exercised to compare data from successive financial reports with data from earlier financial reports and data from successive income tax reports with data from earlier income tax reports.

A contemporary trend in the analysis of financial statements is to place more emphasis on the income statement and the earnings trend of a firm than on the balance sheet of the firm. Therefore, the effect of employing "liberalized depreciation" on the income statement has been emphasized throughout this study. However, balance sheets, as well as income statements, are also analyzed by the firm and by outsiders. One balance sheet ratio that is affected by a change in depreciation methods is the ratio of pledged fixed assets to long-term liabilities. This ratio is often calculated to

measure the degree of security granted to mortgage or bondholders by the pledged assets.

Allocation of Income Taxes. Many firms employ "liberalized depreciation" for income tax reporting and straight line depreciation for financial reporting. Since the depreciation charge is larger for tax reporting than for financial reporting, there is a failure to match revenues and expenses in the financial statements. The amount of distortion is the difference in the taxes paid by employing "liberalized depreciation" over what the taxes would be if straight line depreciation is used. A basic accounting convention holds that the accountant must engage in procedures which facilitate the "matching process," precedent to the preparation of financial statements. In order to correct the distortion in after tax net income it is necessary to charge income in earlier years with an amount equal to the tax reduction and to return this amount to income in subsequent years when the depreciation charge for financial reporting exceeds the depreciation charge for income tax reporting. This procedure has been termed "allocation of income taxes." In its Research Bulletin No. 43 the American Institute of Certified Public Accountants formally recognized the need of accounting for "allocation of income taxes" as a result of the issuance of "certificates of necessity" under the Revenue Act of 1950.²⁵ Later, in Research Bulletin No. 44 (Revised July, 1958) the Institute formally recognized the need of

accounting for "allocation of income taxes" as a result of "liberalized depreciation" being incorporated into the Internal Revenue Code of 1954.²⁶

Ever since this procedure has been approved by the American Institute, the literature has been replete with articles discussing its propriety. Most of the discussion is centered around the handling of the credit corresponding to the additional charge for income taxes. In Research Bulletin No. 44 the American Institute stated that the firm should record the credit as a deferred credit (liability) or recognize the related tax effect as additional depreciation (valuation reserve) in recognition of the loss of future deductability for income tax reporting. A difference of opinion arose among accountants as to the language of Bulletin 44. Some accountants held that, according to the Bulletin, the deferred tax account could be classified in the owners' equity section of the balance sheet as a restriction of retained earnings for future income taxes. Subsequently, the American Institute clarified its position by stating:

The committee used the phrase (a deferred tax account) in its ordinary connotation of an account to be shown in the balance sheet as a liability or a deferred credit. A provision in recognition of the deferral of income taxes, being required for the proper determination of net income, should not at the same time result in a credit to earned surplus or to any other account included in the stockholder's equity section of the balance sheet.²⁷

On February 29, 1960 the Securities and Exchange Commission published Accounting Series Release No. 85. This report

promulgated the policy of the SEC concerning the reporting of the credit arising from "income tax allocation" as follows:

On and after the effective date of this statement of administrative policy, any financial statement filed with this Commission which designates as earned surplus (or its equivalent) or in any manner as a sort of equity capital (even though accompanied by words of limitation such as 'restricted' or 'appropriated') the accumulated credit arising from accounting for reductions in income taxes resulting from deducting costs for income tax purposes at a more rapid rate than for financial statement purposes will be presumed by the Commission to be misleading or inaccurate despite disclosure contained in the certificate of the accountant or in footnotes to the statements, provided the amounts involved are material.²⁸

As the above references suggest, the American Institute and the Securities and Exchange Commission hold that the "allocation of income taxes" credit should be classified on the balance sheet as a liability.

A critical issue in the classification is the point that the liability will never materialize for an expanding firm. For an expanding firm the tax deferral that results from employing "liberalized depreciation" is deferred indefinitely. In a recent issue of the Journal of Accountancy Professor Thomas Keller discusses this problem and draws an analogy between deferred income taxes and bonds payable. He asserts that although deferred income taxes resulting from "allocation of income taxes" may never be paid bonds will in all likelihood never be paid off either.²⁹ Professor Keller concludes that in accounting for "allocation of income taxes" the accountant should classify the credit arising from the

allocation as a liability and by so doing he is merely applying the widely accepted accrual basis of accounting.

Depreciation and the Funds Statement.--In addition to preparing the conventional income statement and balance sheet, accountants often prepare a "statement of sources and application of funds." In general, funds are defined as working capital accounts and the statement analyzes the change in working capital from one period to the next. A variation of the funds statement is the "cash flow statement" which analyzes the change in cash from one period to the next.

Mechanically, the preparation of the funds statement involves adding depreciation back to net income to obtain net income in terms of funds flow (funds being defined as working capital). Net income, as adjusted for non-cash charges (such as depreciation, and non-cash credits represents a source of funds. To this extent, depreciation is a source of funds and if "liberalized depreciation" is used, the effect is to increase the contribution of net income as a source of funds.

It is also true that depreciation affects the determination of net income and therefore affects income tax flows. Using "liberalized depreciation" minimizes income tax flows which constitutes a tax deferral. For expanding firms the deferral tends to become permanent. Therefore, in a sense depreciation is a source of funds to the extent of

the tax deferral.

By definition, however, depreciation is the allocation of the cost of a fixed asset over its estimated useful life. In essence, a fixed asset is a "revenue charge in suspense." The contention that recording depreciation in itself constitutes a source of funds to provide for replacement or expansion of plant and equipment and the contention that expansion and replacement of plant and equipment is provided for by accumulated depreciation is subject to question. Only by physically transferring money from the general cash account to a special fund can the firm be assured that funds will be available for replacement or expansion of plant and equipment. Large firms tend to set funds aside for replacement and expansion while small firms generally do not set funds aside for this purpose. The mere fact that depreciation, particularly "liberalized depreciation," saves tax dollars doesn't necessarily mean the savings will be available for replacement or expansion of facilities at a later date.

"Liberalized Depreciation" and the Cost Principle.--

One of the most important accounting principles is the cost principle. This principle is the "guiding light" for accountants as they record the acquisition of assets. Also, accountants follow the cost principle when presenting asset values on the firm's balance sheet. The cost principle is defined as follows:

Cash Acquisitions--The cost is the minimum cash outlay involved in preparing the asset for use by the firm.

Non Cash Acquisitions--The cost is the fair market value of that received or given, whichever is more clearly ascertainable. In the absence of a fair market value for either that given or received the book value of the asset given up will be the cost of the asset received.

Cost, as determined above, becomes the basis for recording depreciation. Depreciation allocates the cost of an asset over its estimated useful life. With notable exceptions, such as preparing balance sheets for loan purposes, assets are presented on the balance sheet at cost.

Using "liberalized depreciation" does not violate the cost principle of accounting. Total depreciation charges for a given asset are the same for "liberalized depreciation" and straight line depreciation. "Liberalized depreciation" meets the cost principle requirement of being "systematic and rational."³⁰ Therefore, in addition to being acceptable for income tax reporting, "liberalized depreciation" is acceptable for financial reporting. In fact, "liberalized depreciation" may more nearly parallel the economic loss of an asset than straight line depreciation. A case in point might be a new business automobile that depreciates rapidly in early years and less rapidly in later years.

In addition, management may tend to think in terms of relating depreciation charges to repairs of its plant and equipment. High depreciation charges, combined with low repair costs during the early years of an asset's life, may about equal low depreciation charges combined with high repair costs during the later years of an asset's life.

Summary

The impact of "liberalized depreciation" on important managerial decisions was examined in this chapter. Specific areas examined were product pricing, dividend policy, wage negotiations, and analysis of financial statements.

In the section dealing with product pricing traditional pricing theories were reviewed. Using the cost-plus pricing policy as a point of departure, the writer examined the effect of using "liberalized depreciation" on product price by illustrating several variations of cost-plus pricing. In the process of exploring these methods he found that "liberalized depreciation" has a tendency to increase product price by increasing the costs of producing and selling the firm's product.

The writer also examined the relationship of "liberalized depreciation" to dividend policy by analyzing the relationship of dividend policy to earnings of the firm. Also, restrictions on retained earnings that affect dividend policy were explored. An important restriction is the appropriation of retained earnings for replacement and expansion of plant and equipment. Major emphasis was devoted to the relationship of depreciation to retained earnings.

Next, the role of the accountant in wage negotiations was examined with emphasis on the accountant's responsibility to evaluate the employer's "ability to pay." The criteria for disclosure of the firm's financial data was evaluated in

terms of being "reasonable" or "unreasonable" requests. Relevant labor cases dealing with the firm's "ability to pay" were discussed. The relationship of "liberalized depreciation" to the firm's "ability to pay" was analyzed. A suggestion was made that an independent accountant could make a fruitful contribution to wage negotiations.

Subsequently, the relationship of "liberalized depreciation" to the analysis of financial statements was discussed. The desirability of employing consistent depreciation methods in order to facilitate meaningful comparative analysis was also discussed. Next, the position of the accounting profession regarding "allocation of income taxes" that is necessitated by employing "liberalized depreciation" for income tax reporting and straight line depreciation for financial reporting was examined.

Finally, the writer examined the possibility of depreciation constituting a source of funds. "Liberalized depreciation" does not violate the cost principle of accounting. Using "liberalized depreciation" for financial reporting is acceptable accounting theory.

FOOTNOTES

¹Adolph Matz, Othel J. Curry, and George W. Frank, Cost Accounting (3d edition; New York: South-Western Publishing Co., 1962), p. 856.

²Paul A. Samuelson, Economics (5th edition; New York: McGraw Hill, Inc., 1961), p. 545.

³Neil W. Chamberlain, The Firm: Micro Economic Planning and Action (New York: McGraw Hill, Inc., 1962), p. 195.

⁴See Table 16, Chapter IV.

⁵Professor Neil W. Chamberlain has suggested an alternate formula for rate of return pricing which may be employed by a firm using a standard cost system. Op. cit., p. 197.

⁶Matz, Curry, and Frank, op. cit., p. 859.

⁷Chamberlain, op. cit., p. 198.

⁸John Lintner, "Distribution of Incomes of Corporation Among Dividends, Retained Earnings, and Taxes," American Economic Review, Volume XLVI (May, 1956), p. 99.

⁹Ibid., p. 99.

¹⁰Chamberlain, op. cit., p. 279.

¹¹Harry Buttmer, "Dividends and the Law," Accounting Review (July, 1961), p. 435.

¹²These states are Massachusetts, New Hampshire, and Wyoming.

¹³Buttmer, op. cit., p. 434.

¹⁴Wilbert E. Karrenbrock and Harry Simons, Intermediate Accounting (3d edition; New York: South-Western Publishing Co., 1958), p. 723.

¹⁵Ernest Dale, "The Accountant's Part in Labor Relations," Handbook of Modern Accounting Theory, ed. Morton Backer (New Jersey: Prentice-Hall, Inc., 1959), p. 545.

¹⁶Labor Relations Reference Manual, Volume XXXVIII (Washington: The Bureau of National Affairs, Inc., 1946), p. 2042.

¹⁷Labor Relations Reference Manual, Volume XLIII (Washington: The Bureau of National Affairs, Inc., 1949), p. 2462.

¹⁸Dale, op. cit., p. 548.

¹⁹Labor Relations Reference Manual, Volume XLVII (Washington: The Bureau of National Affairs, Inc., 1961), p. 1472.

²⁰"Depreciation and the Steel Strike," The Journal of Accountancy (January, 1960), p. 22.

²¹Ibid., p. 22.

²²A case in point was the U.S. Steel case discussed in Chapter II of this study.

²³American Institute of Certified Public Accountants, Accounting Research and Terminology Bulletins (Final Edition; New York: American Institute of Certified Public Accountants, 1961), p. 15.

²⁴Ibid., p. 15.

²⁵Ibid., p. 75.

²⁶Ibid., p. 1-A.

²⁷Ibid., p. 7-A.

²⁸United States Securities and Exchange Commission, Accounting Series Releases 78 to 89 Inclusive (Washington: U.S. Government Printing Office, 1962), p. 60.

²⁹Thomas F. Keller, "The Annual Income Tax Accrual," The Journal of Accountancy (October, 1962), p. 63.

³⁰op. cit., p. 1-A.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The evolution of depreciation practices in the United States falls into four periods: before 1913, 1913 to 1934, 1934 to 1954, and after 1954. Prior to 1900 the concept of depreciation was of relatively minor importance to accountants and economists. Around the turn of the century the merger and consolidation movement in the United States created a need for refinement of measures of business income. Discussions of depreciation practices began to appear. In 1909 the Supreme Court recognized depreciation as an operating expense in the Knoxville Water Company case. The sixteenth amendment to the Constitution was followed by the Revenue Act of 1913. This act authorized the deduction of depreciation in the computation of net income for income tax reporting.

During the period 1913 to 1934 business was allowed a large degree of discretion in the computation of depreciation charges. In 1934 the Treasury Department issued Treasury Decision 4422 which shifted to business the burden of proof as to the reasonableness of depreciation deductions. This was partially in response to the need for increased

federal revenue resulting from "new deal" legislation.

From 1934 to 1954 depreciation allowances were scrutinized closely by Internal Revenue agents. In 1942 Bulletin F strengthened Treasury Decision 4422 by requiring firms to depreciate plant and equipment over a longer period of years than had previously been the case. In the late 1940's business firms began to show considerable interest in faster depreciation rates. The Internal Revenue Code of 1954 specifically authorized the use of two "liberalized depreciation" methods for income tax reporting. They are the sum of the years-digits method and the declining balance method. Although a variation of the declining balance method had been authorized in the Internal Revenue Code of 1939, the 1954 rule is more liberal.

Since 1954 there has been a vigorous trend toward allowing more "liberalized depreciation" for income tax reporting. In 1958 business firms were allowed an additional first year 20 per cent depreciation charge, with a maximum allowance of \$2,000. In July, 1962 the Treasury Department issued Revenue Ruling 62-21, setting forth new depreciation guidelines which rendered Bulletin F obsolete. In addition to the events outlined above "certificates of necessity" were issued during World War I, World War II, and the Korean War. The certificates were a form of "liberalized depreciation," since they provided for writing off the cost of plant and equipment related to the production of war materials at an

accelerated pace (generally 60 months).

The principal empirical studies concerning the use of "liberalized depreciation" have been conducted by:

Financial Institute Research Foundation
National Association of Accountants
American Institute of Certified Public Accountants
Machinery and Allied Products Institute
Treasury Department

Each of these studies was discussed. Up to 1956 the Machinery and Allied Products Institute study was the most comprehensive. A major limitation of the study, however, was that it was restricted to the manufacturing industry. The firms that participated in the sample varied from small to large. "Liberalized depreciation" was used by 62 per cent of the firms for income tax reporting. Eighty-five per cent use consistent methods for financial and income tax reporting. Therefore, "liberalized depreciation" is used by most of the firms for financial and income tax reporting.

The Financial Executive Research Foundation study was conducted in 1960. A major virtue of this study was that depreciation practices of a wider sample of industries were surveyed. Seventy-seven per cent of the companies that participated in the survey use some method of "liberalized depreciation" for both financial and income tax reporting.

In 1961 the Treasury Department conducted a depreciation survey, in cooperation with the Small Business Administration. The distinctive feature of the Treasury study was that the study surveyed depreciation practices of small,

as well as large, firms. An analysis of the preliminary report of the Treasury was presented. Data from the final report are not yet available for public distribution. The most significant finding of the survey was that 70 per cent of the large firms and 53 per cent of the small firms use "liberalized depreciation" for income tax reporting. Six out of 10 large firms use the same depreciation method for financial and income tax reporting. Nine out of 10 small firms use the same depreciation method for financial and income tax reporting. Therefore, "liberalized depreciation" is widely used for financial and income tax reporting by most firms participating in this survey.

The American Institute of Certified Public Accountants studies and the National Association of Accountants study were of limited value, compared with the other three studies. The size of these surveys and the nature of the firms surveyed place restrictions on their utility. However, the results of these studies were consistent with the results of the other studies. Seventy-three per cent of the firms in the National Accounting Association study and 61 per cent of the firms in the American Institute study use "liberalized depreciation." The National Accounting Association study is based on income tax reporting and the American Institute study is based on financial reporting. The results of all of the five studies were consistent. They reflect that a majority of the firms surveyed (from 53 to 77 per

cent) use "liberalized depreciation."

Next, the effect "liberalized depreciation" may have on investment decisions was examined. The approach used was to assume traditional quantitative methods of evaluation of alternative investment proposals used by management. The writer examined the relationship of "liberalized depreciation" to these quantitative methods. Specific quantitative methods examined were payback period analysis and alternative rate of return analyses.

Results of the payback period analysis and the "unadjusted rate of return" method were deemphasized, due to the lack of realism associated with the methods. Payback period analysis disregards the contribution an asset makes to the production of revenue beyond the payback period. The "unadjusted" or average rate of return method does not allow for differences in timing of cash receipts and expenditures.

The "discounted cash flow" rate of return methods indicate that "liberalized depreciation" contributes to providing a higher rate of return by decreasing income tax flows. The "rate of return variant" was used to illustrate the relationship of straight line depreciation to rate of return by employing a formula. Using "liberalized depreciation" will cause annual cash receipts to vary. Therefore, the trial and error approach, which allows for variation in cash receipts, was used to illustrate the relationship of "liberalized depreciation" to rate of return.

The time discount gain feature of "liberalized depreciation," which is based on the concept of present values, was discussed and illustrated. The major conclusion was that, from the viewpoint of the firm, the optimum depreciation method is the one that yields the greatest present value. "Liberalized depreciation" yields considerably higher present values than straight line depreciation. The optimal method of "liberalized depreciation" is dependent upon three parameters: the useful life of the asset, the cost of the asset, and the salvage value of the asset. In general, a high service life supports the sum of the years-digits method; a high salvage value supports the declining balance method; and a high cost of capital supports the declining balance method.

The contention that the benefits of "liberalized depreciation" are lost in the long run was also examined. Only if the firm liquidates by retiring its investment in plant and equipment will the tax savings be lost. There will still be a gain from using "liberalized depreciation," however, assuming the tax savings of early years are invested or used as working capital by the firm. The tax savings will be deferred indefinitely if a firm maintains its investment in plant and equipment.

Some economists have suggested that there is a relationship between "liberalized depreciation" and economic growth. Part of one chapter in this study was devoted to a

discussion of this relationship. The approach used was to cite the importance economists attribute to the role of capital formation in the development of economic growth theories. The "balanced growth" thesis suggested by Ragnar Nurkse and the Hirschman - Singer thesis were discussed in order to emphasize the importance of capital formation in both theses. After discussing the relationship of capital formation to economic growth, the writer viewed "liberalized depreciation" as a device to stimulate capital formation. Alvin Hansen and other authorities on the subject hold that "liberalized depreciation" stimulates capital formation. Robert Eisner and others hold that "liberalized depreciation" may not stimulate capital formation. The writer could find no empirical evidence to support either position.

After this, the relationship of "liberalized depreciation" to managerial decisions other than investment decisions was discussed. An examination of the relationship of "liberalized depreciation" to product pricing was made. Using the cost-plus pricing theory as a point of departure, the writer illustrated various cost-plus pricing methods in order to observe the effect of "liberalized depreciation" on product price. The major conclusion was that "liberalized depreciation" has a tendency to increase product price by increasing production costs. This was under the assumption that the demand for the firm's product is inelastic. Non-quantitative factors, such as estimates of consumer

responses and varying market structures, place severe limits on the usefulness of the cost-plus pricing theory.

Next, the relationship between "liberalized depreciation" and dividend policy was examined. Empirical studies emphasizing the desire on the part of management to maintain dividend stability were discussed. However, the relationship of dividend distributions to profits and the relationship of "liberalized depreciation" to profits was noted. The conclusion tentatively reached was that consistent application of "liberalized depreciation" by expanding firms may make possible larger dividend distributions, at least in the long run.

Wage determination is another management decision that may be affected by "liberalized depreciation." An important issue in contemporary wage negotiations is the firm's "ability to pay." The relationship of "liberalized depreciation" to wage negotiations through its impact on reported profits was discussed. Of particular interest is the importance labor and management attributed to "liberalized depreciation" during the steel strikes of 1959. Labor held that reported profits were too low because the steel companies used "liberalized depreciation." Management, on the other hand, held that reported profits were too high because of accounting for depreciation in terms of historical cost, regardless of the method of depreciation employed. The independent accountant is uniquely equipped to serve

labor-management wage negotiations in much the same way the independent auditor certifies as to the authenticity of a firm's financial statements.

Finally, the relationship of "liberalized depreciation" to the analysis of financial statements was discussed. An important procedure that effects the analysis of financial statements is "allocation of income taxes." This procedure is followed by some firm's that use "liberalized depreciation" for income tax reporting and straight line depreciation for financial reporting. There is a critical issue related to the procedure, namely that the additional tax liability associated with the procedure may never materialize. Tax deferrals that occur by using "liberalized depreciation" are deferred indefinitely for firms that continue their investment in plant and equipment. Therefore, executives of some firms hold that it is not necessary to follow the "allocation of income taxes" procedure. Following this, there is the contention that depreciation provides funds. The conclusion was that the recording of depreciation itself provides funds only to the extent that it effects income tax flows. By using "liberalized depreciation," the income tax flow is minimized.

A major part of the study was concerned with "liberalized depreciation" as an income tax savings device. In the last part of the study, however, the writer examined briefly whether "liberalized depreciation" is compatible

with the "cost principle." This principle is followed in accounting for the purchase and use of plant and equipment for financial accounting. He concluded that "liberalized depreciation" has theoretical justification as well as being a device to minimize income tax flows.

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