ABSTRACT

A STUDY OF THE PREDICTIVE SIGNIFICANCE OF SEVERAL INCOME MEASURES RELATIVE TO THE ACCOUNTING FOR EXTRAORDINARY ITEMS AND PRIOR PERIOD ADJUSTMENTS

by James E. Parker

Summary of purpose and research design.

The problem addressed in this study concerns the method of reporting extraordinary items and prior period adjustments in annual financial reports of business corporations. The criterion of predictive assistance was selected as a means of providing a possible solution to the diversity of views surrounding this area of financial reporting. Finally, historical empirical evidence was examined with respect to the predictive assistance criterion in comparing several income reporting alternatives. Comparisons were made on both a conceptual level, i.e. between reporting concepts, and on a pragmatic level, i.e. between reporting practices. The "concepts" and related "practices" were as follows:

Concept	Related practice
Current operating performance	As reported
Modified all-inclusive	Modified all-inclusive
All-inclusive	--

The basic technique of this study was to examine each of several income reporting alternatives with respect to

resulting forecasts where earnings per share figures based on each reporting alternative were used as inputs to two different prediction models. The resulting forecasts were then compared to actual results (measured (a) by the same income reporting alternative and (b) by the all-inclusive alternative), with the dollar difference between the forecast value and actual value being expressed as a percentage of the actual. These ratios constitute the forecast error measures that were compared to determine which of the associated reporting alternatives would have been (for the test period) of greater aid in forecasting earnings potential.

Findings, conclusions, and implications

The findings of any predictive study depend in part upon the particular model(s) employed. However, from the various findings of this study, it would appear that in general there was a greater effect upon both forecast magnitude and associated error resulting from the choice of historical time periods than from the choice of either prediction model, forecast objective, or income reporting alternative.

Arguments for both the current operating performance concept (as a theoretical ideal) and the "as reported" practice (as a realized resultant of this ideal) are based solely on the generation of data more useful in making future

predictions. Given the research design of this study, historical empirical evidence failed to substantiate this argument. Thus the writer considers this study to be empirical support for the position advanced in Accounting Principles Board Opinion No. 9 with respect to the single amount to be designated as net income for the period.

In addition to comparing the various concepts and practices with respect to goodness of forecasts (i.e. magnitude of absolute percentage forecast error), they were also examined from the viewpoint of conservatism, i.e. as to which alternative, if any, tended to consistently result in lesser forecasts. Examination of the findings led the writer to the following conclusions. In general, the current operating performance concept resulted in significantly lesser forecasts than did either of the other two concepts. However, there was no significant consistent difference with respect to forecast amounts under each of the two practices. This suggests the notion that in practice management varies its interpretation of accounts and/or method of accounting in such a way as to maximize the firm's apparent earnings potential. Accordingly a comparison was made between the current operating performance concept and the "as reported" practice. The findings are consistent with this notion. A similar comparison was

also made with respect to goodness of forecasts. However, the findings showed no significant differences.

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By

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computers of the Michigan State University Computing Laboratory. Without these facilities this study would not have been feasible.

Financial support received during the course of my doctoral studies is gratefully acknowledged. The following organizations and individuals made it possible for me to hasten the completion of my doctoral studies: American Accounting Association, Haskins & Sells, and the many contributors to the fellowship fund of the Department of Accounting and Financial Administration.

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CHAPTER I

INTRODUCTION

1.1 Purpose of study

This research is an attempt to find a reasoned (based upon the criterion of predictive ability) and empirically supported resolution of conflicting viewpoints as to the inclusion or exclusion of extraordinary items and prior period adjustments in the determination and reporting of the periodic net income of business corporations for both the current and prior reporting periods.

The measurement in the "real world" of business income is a complex and loosely defined process. This has been in no small part due to a lack of agreement among businessmen, accounting practitioners, and accounting theorists as to the basic concept of income itself. As a result, many controversies have arisen among and between those engaged in the practice of preparing financial statements and those using said statements which purport to "present fairly". Noting that "There is a considerable diversity of views as to whether extraordinary items and prior period adjustments should enter into the determination of net income of the period in which

they are recognized,"[1] the Accounting Principles Board of the American Institute of Certified Public Accountants acted recently in the controversy to which this study is addressed.

The fact that Accounting Principles Board Opinion Number 9 deals specifically with this problem area does not make it resolved. "At stake is the usefulness of the income statement and the public's confidence in it."[2] The following examples illustrate the continuing controversy over this subject:

> The recommendations for reporting corrections and extraordinary items listed in Accounting Principles Board Opinion No. 9 (December 1966) appear deficient. As will be shown below, they do not always result in full disclosure, and they permit inaccurate reporting of periodic income. In effect, they represent authoritative pronouncements rather than consistent applications of reasoned principles.[3]
>
> Possibly because of the absence of a research study issued by the AICPA and available for discussion by all concerned prior to the drafting of an opinion and possibly for other reasons, APB Opinion No. 9 falls short, in the author's view, of meeting the need for change in some areas while going too far in others.[4]

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[1]Accounting Principles Board, "Reporting the Results of Operations," Opinion No. 9 (New York: American Institute of Certified Public Accountants, December, 1966), p. 109.

[2]Leopold A. Bernstein, <u>Accounting for Extraordinary Gains and Losses</u> (New York: The Ronald Press Company, 1967), p. 9.

[3]Donald A. Corbin, "Reporting Unexpected Items: A Dissent to APB Opinion No. 9," paper presented to the accounting faculty and graduate students, University of Washington, November 8, 1968, p. 1.

[4]Bernstein, <u>Accounting for Extraordinary Gains and Losses</u>, p. 310.

A contribution toward a reasoned and empirically supported solution to this "diversity of views" under present day conditions was the objective of this research effort.

1.2 Statement of problem

This section includes only a brief discussion of the problem and two opposed views of income. For a more detailed description of the problem including the historical evolution of both the problem and authoritative opinion related thereto, the reader is referred to Part I of Bernstein's Accounting for Extraordinary Gains and Losses.

Under currently acceptable accounting practices, certain gains and losses are often realized during a period or periods for which they are deemed not to be resulting from the regular operations (for that period) of the firm. Examples of such items include the following:

1. Gains or losses on sales or other disposals of fixed assets, investments, and divisions.
2. Gains or losses on changes in valuation bases of inventories, investments, and fixed assets.
3. Foreign exchange adjustments.
4. Plant expenses deemed to be nonrecurring.
5. Prior year adjustments.
6. Catastrophe losses.

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The above examples do not constitute an exhaustive listing but rather should only be considered as illustrative of the nature of the items under consideration. Adjustments and/or transactions of a capital nature are not included since it is widely agreed that such items are not income. The significance of those items considered "extraordinary" lies in the nature and timing of the recognition of their effect on the earned portion of owners' equity and on the likelihood of their reoccurrence in future periods. The distinction between income and capital adjustments and/or transactions is not the concern of this research, i.e. distinctions as reflected in published annual reports will be taken as given for purposes of this study.

The question of singular importance becomes "How should extraordinary gains or losses and/or prior period income adjustments be reflected in the reporting of the firm's income (and earnings per share)?" This question is phrased from a reporting viewpoint because it is an answer to a reporting problem that is sought as the objective of this study. It may be argued that two matters are involved: (1) determining financial information and (2) reporting financial information. This may be, but the distinction is irrelevant for the external user of the financial statements. For

him the most important (and often the only) source, either directly or indirectly, of financial information is the firm's published financial statements. To this user, there is only the reported information. Hence, this study is directed at the reporting level.

Basically, two opposed reporting concepts of income have appeared both in the literature and practice. These are the all-inclusive concept and the current operating performance concept. Under the all-inclusive concept, all items affecting the net change in owners' equity between two points in time, excepting capital transactions and adjustments, are included in the determination of that amount labeled "net income for the period" in the firm's annual financial statements. Under the current operating performance concept, extraordinary items and prior period adjustments are not included in the amount labeled "net income for the period", but rather are shown as direct increases or decreases to the earned portion of owners' equity.

1.2.1 Arguments pro and con

The arguments for and against the all-inclusive and current operating performance reporting concepts of income have long appeared in the literature. Meigs, Johnson, and him the most important (and often the only) source, either directly or indirectly, of financial information is the firm's published financial statements. In this case, there is only the reported information. Hence, this study is directed at the reporting level.

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1.2.1 Arguments pro and con

The arguments for and against the all-inclusive and current operating performance reporting concepts of income have long appeared in the literature. Meigs, Johnson, and

Keller have summarized these arguments as follows:[5]

Arguments for all-inclusive income reporting

1. Income for any period is the realized increase in net assets during the period as a result of the entire set of conditions facing the business during that period. An item is no less a part of this picture because it is unusual in nature or amount. Gains or losses relating to activities of prior years but arising because evidence is now available that was not clear in the past are likewise a part of that picture.

2. Periodic income is difficult if not impossible to determine precisely; many elements of revenue and expense are a product of events relating to several accounting periods. The reader of financial statements is best served if he can accept the income report with confidence that it fully reflects all events that either occurred or came to light during the current period. At the same time, careful labeling and disclosure will ensure that he can distinguish unusual items and corrections of past errors from the other elements of the net income figure.

Arguments against the current operating performance concept

A feeling that the alternative is less desirable is a form of argument on the side of any proposition, and many who support the all-inclusive view are persuaded of its merit by the dangers they see in alternatives: The user of accounting statements who is not trained in accounting may not be aware that the income statement is incomplete and thus may not look to the retained earnings statement for extraordinary items. This opens the way for possible manipulation of reported income data, since there are many borderline cases between what is recurring and nonrecurring, current and

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[5]Walter B. Meigs, Charles E. Johnson, and Thomas F. Keller, Intermediate Accounting (New York: McGraw-Hill Book Company, 1963), pp. 104-5.

noncurrent, ordinary and extraordinary. Management may thus be tempted to 'normalize' reported income by varying its interpretation of what falls in these categories at different times.

Arguments for current operating performance income reporting

1. Readers of financial statements attach great importance to the figure labeled 'net income,' both in comparing the performance of different companies and as a guide in estimating probable earnings in the near future. A net income figure that reflects the current operating performance of a company best serves these objectives since unusual items by their very nature are peculiar to a given firm and are not likely to recur in future years.

2. The accountant is familiar with the underlying events behind income statement figures. He is thus better equipped than the reader of a published statement to make a distinction between the factors that are a part of a company's current operating performance, and those that reflect past errors or unusual events.

Arguments against the all-inclusive concept

1. If errors of prior periods are included as a part of current reported net income a double distortion results: Past income was misstated; and the income of the current year is misstated in the opposite direction.

2. If unusual or extraordinary charges or credits are included in reported net income, the casual reader of financial statements may be misled; the reported 'earnings per share' of companies is a figure widely reported in the financial news, and often the fact that corrections or unusual items are included in the figure goes unmentioned.

1.2.2 Empirical significance of the problem

The practical importance of any research study in accounting should be considered. To obtain an indication of the empirical significance of extraordinary items and prior year adjustments in published annual reports of industrial and commercial corporations in the United States, a preliminary review was made covering the most recent eleven year period (1956-66) for which data were readily available. This review was based solely on information reported in Accounting Trends & Techniques,[6] an annual survey of the accounting aspects of the annual reports of 600 industrial and commercial corporations, conducted by the staff of the American Institute of Certified Public Accountants.

In order to be able to make definitive statements concerning intuitively perceived tendencies observed from the data presented in Tables I, II, and III, best fitting straight lines were determined for certain of the time series data by employing the method of least squares. The slopes of these lines are parenthetically referred to in the following remarks concerning trends.

Table I below reveals the number of companies identifying

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[6]American Institute of Certified Public Accountants, Accounting Trends & Techniques (New York: AICPA, 1957-67).

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[6] American Institute of Certified Public Accountants, Accounting Trends & Techniques (New York: AICPA, 1957-67).

one or more items as extraordinary in their annual reports and their reporting treatment of such items.[7]

Over the entire period an average (mean) of 203 companies or 34 per cent reported one or more extraordinary items in each year. Taking the sample of 600 companies to be representative, it would appear that for approximately one-third of all United States industrial and commercial corporations in the average year, there is the problem of determining the proper disposition of one or more extraordinary items in their financial statements.

As can be seen from Table II, the total number of extraordinary items reported in each year by the 600 companies tended to decrease slightly (slope of -7.09) over the entire period, noting in particular that for those companies reporting one or more extraordinary items, the following tabulation

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[7]The reader is warned of the following inconsistency between years in the information reported by Accounting Trends & Techniques. For 1963 and prior years, extraordinary items shown after net income for the year on the income statement were designated "Income". For 1964 and 1965, such items were denoted "Retained Earnings". This inconsistency was observed from a detailed description of the accounting treatment given extraordinary items which has been summarized into the designations of "Income" and "Retained Earnings" as shown in Tables I and II. It was not possible to eliminate this inconsistency in summarizing the information due to the fact that Accounting Trends & Techniques reports detail only by number of items - not by number of companies.

TABLE I

NUMBER AND PER CENT OF 600 COMPANIES
REPORTING IN ACCORDANCE WITH EACH OF THREE ALTERNATIVES

Year	No Extra-Ordinary Items		Adjusting Accounts for Extraordinary Items							
			Total		Income		Retained Earnings		Capital Surplus	
	No.	%	No.	%	No.	%	No.	%	No.	%
1956	360	60	240	40	211	35	27*	5	2	-
1957	416	69	184	31	158	26	24**	4	2	-
1958	368	61	232	39	191	32	37+	6	4	1
1959	387	65	213	35	194	32	32	3	2	-
1960	370	62	230	38	193	32	36	6	1	-
1961	378	63	222	37	183	31	37	6	2	-
1962	366	61	234	39	186	31	45	7	3	1
1963	397	66	203	34	156	26	45	8	2	-
1964	413	69	187	31	119	20	68	13	0	0
1965	426	71	174	29	96	16	77++	13	1	-
1966	481	80	119	20	60	10	59+++	10	0	0

*Includes 6 companies adjusting both income and retained earnings.
**Includes 4 companies adjusting both income and retained earnings.
+Includes 12 companies adjusting both income and retained earnings.
++Includes 18 companies adjusting both income and retained earnings.
+++Includes 3 companies adjusting both income and retained earnings.

shows a rather stable pattern in the average number of such items per company per year:

1956 = 1.20	1960 - 1.41	1964 - 1.35
1957 - 1.40	1961 - 1.41	1965 - 1.44
1958 - 1.39	1962 - 1.58	1966 - 1.36
1959 - 1.31	1963 - 1.30	

TABLE II

NUMBER AND PER CENT OF ITEMS
TREATED IN ACCORDANCE WITH EACH OF THREE
REPORTING ALTERNATIVES BY THE 600 SAMPLE COMPANIES

Year	Total Number of Items	Accounts Adjusted for Extraordinary Items: Income No.	Income %	Retained Earnings No.	Retained Earnings %	Capital Surplus No.	Capital Surplus %
1956	289	254	88	33	11	2	1
1957	257	226	88	29	11	2	1
1958	322	277	86	41	13	4	1
1959	280	246	88	32	11	2	1
1960	324	263	81	60	19	1	-
1961	312	246	79	64	21	2	1
1962	369	273	74	93	25	3	1
1963	264	201	76	61	23	2	1
1964	252	152	60	100	40	0	0
1965	250	143	57	106	42	1	-
1966	162	79	49	83	51	0	0

Although there was a slight decrease in the number of extraordinary items, an examination of Table III reveals an increase in the materiality of all such items. This statement is based upon slopes of 1.78 and 1.26 respectively for the best fit lines associated with the number of items and percentage re the highest percentage materiality group (over 50%) of Table III, and slopes of -5.99 and -1.53 for those lines associated with the number of items and percentage re

TABLE III

PERCENTAGE OF MATERIALITY* OF INDIVIDUAL ITEMS
REPORTED BY 600 SAMPLE COMPANIES

		0-5%		6-10%		11-20%		21-50%		Over 50%		N	
Year	Total	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1956	289	143	49	38	13	42	15	41	14	15	5	10	3
1957	257	91	35	33	13	32	12	38	15	36	14	27	11
1958	322	86	27	52	16	42	13	45	14	61	19	36	11
1959	280	88	31	43	15	41	15	41	15	30	11	37	13
1960	324	111	34	47	15	48	15	41	13	60	19	17	5
1961	312	97	31	45	14	46	15	45	14	52	17	27	9
1962	369	120	32	45	12	45	12	50	14	60	16	49	14
1963	264	77	29	37	14	40	15	43	16	55	21	12	6
1964	252	84	33	36	14	39	15	24	10	51	20	18	7
1965	250	76	30	41	16	44	18	26	10	50	20	13	5
1966	162	27	17	41	25	26	16	22	14	39	24	7	4

*Ratio of item to current year earnings adjusted for extraordinary items and income tax adjustments.

N Percentage of materiality not determinable.

the lowest percentage materiality group (0-5%) of Table III. Thus there has been both a relative and absolute increase in those extraordinary items of relatively greater amount. As a summary of the practical significance of the problem, we may say that over the period examined 34 per cent of the companies reported an average of 1.38 extraordinary items per year with the average materiality of the items increasing slightly.

1.3 Authoritative opinions

The diversity of views as to whether extraordinary items and prior period adjustments should enter into the determination of net income of the period in which they are recognized, is not of recent origin. Writers on the subject include W. G. Rowe,[8] A. C. Littleton,[9] Thomas W. Leland,[10] Maurice H. Stans,[11] and Arthur Andersen & Co.[12] among others.

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[8] W. G. Rowe, "Surplus Adjustments," Accounting Review, VIII (October, 1933) 293.

[9] A. C. Littleton, "The Integration of Income and Surplus Statements," Journal of Accountancy, LXIX (January, 1940), 40.

[10] Thomas W. Leland, "Revenue, Expense, and Income," Accounting Review, XXIII (January, 1948), 22.

[11] Maurice H. Stans, "Modernizing the Income Statement," Accounting Review, XXIV (March, 1949), 7.

[12] Arthur Andersen & Co., Accounting and Reporting Problems of the Accounting Profession (Chicago: Arthur Andersen & Co., 1962), p. 39.

The arguments for and against the all-inclusive and current operating performance concepts were summarized above and will not be repeated. At this point only the conclusions reached by three authoritative bodies will be presented.

The following quotations reflect the American Accounting Association's committees' preference for the all-inclusive approach toward the reporting of period income:

> The income statement for any given period should reflect all revenues properly given accounting recognition and all costs written off during the period, regardless of whether or not they are the results of operations in that period.[13]

> For any one year the income statement should reflect all realized revenues, and all costs and losses written off during that year, whether or not they have resulted from ordinary operations.[14]

> The income of an accounting period should be reported in a statement providing an exhibit of all revenue and expense (including losses) given accounting recognition during that period.[15]

> The realized net income of an enterprise measures its effectiveness as an operating unit and is the change in its net assets arising out of (a) the excess or deficiency of revenue compared with related

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[13]American Accounting Association, Executive Committee, "A Tentative Statement of Accounting Principles Underlying Corporate Financial Statements - 1936," Accounting and Reporting Standards for Corporate Financial Statements and Supplements (Madison, Wisconsin: American Accounting Association, 1957), p. 67.

[14]*Ibid*., 1941 Statement, p. 55.

[15]*Ibid*., 1948 Revision, p. 17.

expired cost and (b) other gains or losses to the enterprise from sales, exchanges, or other conversions of assets.[16]

However, in its 1957 revision, the Association's committee stated an exception (with respect to prior period adjustments) in its preference for the all-inclusive approach:[17]

The reports for the period will encompass not only those transactions which arise from operations of the period, but also some transactions completed during the period and related to activities of prior periods. Transactions relating to current operations should be reported as components of realized net income of the period. Income-determining transactions recognized in the current period but primarily relating to prior activities should not affect the determination or reporting of realized net income of the period.

Until APB Opinion Number 9, the American Institute of Certified Public Accountants had expressed its preference for the current operating performance approach as follows:[18]

The committee has indicated elsewhere that in its opinion it is plainly desirable that over the years all profits and losses of a business be reflected in net income, but at the same time has recognized that, under appropriate circumstances, it is proper to exclude certain material charges and credits from the determination of the net income of a single year, even though they clearly

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[16] Ibid., 1957 Revision, p. 5.

[17] Ibid., p. 8.

[18] American Institute of Certified Public Accountants, Committee on Accounting Procedure, Accounting Research and Terminology Bulletins, Final Edition (New York: AICPA, 1961), p. 63.

> affect the cumulative total of income for a series of years. In harmony with this view, it is the opinion of the committee that there should be a general presumption that all items of profit and loss recognized during the period are to be used in determining the figure reported as net income. The only possible exception to this presumption relates to items which in the aggregate are material in relation to the company's net income and are clearly not identifiable with or do not result from the usual or typical business operations of the period.

In December, 1966, however, the official stance of the institute was changed with the issuance of Opinion No. 9 of the Accounting Principles Board. As pointed out by Savage and Snavely,[19]

> Part I of Opinion No. 9 makes the following changes: (1) It changes the definition of extra-ordinary items. The criteria to be used in determining whether or not an item qualifies as extraordinary differ significantly from those in use prior to the effective date of the opinion. (2) It changes the definition of prior period adjust-justments. Here again, the prescribed criteria differ significantly from the ones formerly used. (3) It requires that the amount shown as net income on income statements include all items of profit and loss recognized during the period except for prior period adjustments as newly defined. (4) As a result of the changes in definitions of extra-ordinary items and prior period adjustments, the opinion causes the amount shown as net income before extraordinary items to include items of profit and loss that heretofore were considered to be extraordinary and/or corrections of prior years'

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[19]Allan H. Savage and Howard J. Snavely, "The Accounting Principles Board and Opinion No. 9," Unpublished paper prepared at the University of Texas at Arlington, p. 1.

income figures. (5) It requires that all extra-ordinary items (as newly defined) be shown in a separate section of the income statement. (6) It requires that all prior period adjustments (as newly defined) be shown in the statement of retained earnings.

As Bernstein points out, the Securities and Exchange Commission has generally favored the all-inclusive approach, its position "materially unchanged over the years."[20] However, Rule 5-03 of Regulation S-X does provide for the addition or deduction from that amount labeled net income or loss, at the bottom of income statements filed with the Commission, of items equivalent to direct credits or charges to retained earnings.[21] Thus, certain items may be excluded from the amount specifically designated as net income for the period.

1.4 The modified all-inclusive concept

As discussed above there have been basically two opposed concepts of reporting income appearing both in the literature and in practice over the years, the all-inclusive concept and the current operating performance concept. However, with the advent of APB Opinion No. 9 a new concept was advanced. This concept will be referred to as the "modified

[20] Bernstein, Accounting for Extraordinary Gains and Losses, p. 25.

[21] Securities and Exchange Commission, Regulation S-X, Washington, D.C., Revised 1958.

all-inclusive concept." Under the modified all-inclusive concept the only exclusions in the determination and reporting of net income for the current period are those items deemed to be "prior period adjustments." According to Opinion No. 9, prior period adjustments are "limited to those material adjustments which (a) can be specifically identified with and directly related to the business activities of particular prior periods, and (b) are not attributable to economic events occurring subsequent to the date of the financial statements for the prior period, and (c) depend primarily on determinations by persons other than management and (d) were not susceptible of reasonable estimation prior to such determination."[22] The Board expects such items to be rare in modern accounting and that, in most cases where there is a prior period adjustment, "the opinion of the reporting independent auditor on such prior period would have contained a qualification because of the uncertainty (then existing)."[23]

The concern of this dissertation research is an evaluation (in terms of the criteria of predictive ability) of the relative merits of the three reporting concepts of income with regard to the inclusion or exclusion from reported net

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[22] Accounting Principles Board, Opinion No. 9, p. 115.

[23] Ibid.

income of extraordinary items and/or prior period adjustments. To summarize, those favoring the all-inclusive approach would include in current income all changes in owner's equity not due to capital transactions; those favoring the modified all-inclusive concept would do likewise except that prior period adjustments (as newly defined) would be excluded; and those favoring the current operating performance concept would exclude all extraordinary items and prior period adjustments from the current period's net income.

1.5 Other doctoral research

A canvass of the literature revealed two recent doctoral dissertations in the area of accounting for extraordinary items and prior year adjustments.[24] Both studies approached the solution to "the diversity of views" on the basis of *a priori* reasoning, an approach that has refused to yield a practical solution for many years. Wright's empirical findings, covering a five year period and expressed mostly in industry aggregates, simply support the contention that a

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[24]Albert Walter Wright, Jr., *Accounting for Extraordinary Charges and Credits and Their Implications For Net Income*, Unpublished Doctoral Dissertation, University of California, Los Angeles, 1965, and Leopold A. Bernstein, *Extraordinary Items of Gain or Loss: A Research Study of Theory and Practice*, Unpublished Doctoral Dissertation, New York University, 1966.

problem exists. The empirical portion of Bernstein's work, mostly concerned with a two year period, is also a cross-sectional analysis as opposed to a study of time series data.

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CHAPTER II

BASIC RESEARCH APPROACH

2.1 Fundamental nature of the problem

The idea of including extraordinary items in the amount reported as net income for the period can be supported on two grounds. The first is that reported income should, by definition, reflect all changes in the economic well-being of the entity to the extent that such changes are recognized by the generally acceptable accounting practices in use. This view is thus based upon an absolute concept of income, i.e., it is not dependent upon a specified use of the resulting information generated under the concept. Secondly, income reported on this basis may be considered as the more useful to the reader in obtaining a given objective. It should be noted that proponents of both the all-inclusive and modified all-inclusive concepts advocate the inclusion of extraordinary gains and/or losses and thus argue on each of these two grounds.

However, proponents of the current operating performance concept base their arguments largely, if not solely, on grounds of providing more useful information in financial reports. The proper amount to be labeled net income for the period i

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period is that amount that will prove most useful to the users of the financial statements. Under this approach, the notion of a "true" or "actual" income concept is meaningless. The concept of income is an abstraction, i.e., an abridgment of reality. Its justification for existence lies solely in its utility.

The question of whether to include prior period adjustments in the amount reported as net income for the period can be approached in a parallel fashion to that employed regarding extraordinary gains and losses. Net income for the current period should not, by definition, reflect economic changes that did not occur during the current period. However, proponents of the all-inclusive concept have argued that such exclusions open the door for presenting misleading apparent earnings potential, i.e., that the exclusion of prior period adjustments could actually reduce predictive assistance of reported income figures.

It should be noted that this study is not directly concerned with the desirability of eliminating what some[1] have called an "undue" emphasis on the needs of those who will not or cannot use the financial statements as a whole,

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[1]For example, see Bernstein, Accounting for Extraordinary Gains and Losses, p. 198. ". . .anyone who chooses to use single figures out of its (sic) context (should not) blame the accountant for the possible adverse results of his poor judgment."

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i.e., the focus on a single net income figure as opposed to all items making up the total change in owners' equity over a period. This study takes this "undue" emphasis on the net income figure as a fact of life and attempts to resolve the single question of how extraordinary items and prior period adjustments should be reported given this behavioral characteristic on the part of some users.

To summarize, the idea of "true" income supports only the modified all-inclusive concept toward income reporting, whereas the notion of employing the "most useful" concept of income could be used in support of whichever one of the three concepts is deemed to result in the generation of information more useful in obtaining a given objective.

2.2 <u>The function of accounting</u>

Accounting has been defined as "the process of identifying, measuring, and communicating economic information to permit informed judgments and decisions by users of the information."[2] From this definition, it follows that the function of accounting is to "permit informed judgments and decisions."

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[2]American Accounting Association, Committee to Prepare a Statement of Basic Accounting Theory, <u>A Statement of Basic Accounting Theory</u>, (Evanston, Illinois: American Accounting Association, 1966), p. 1.

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Before economic information can be identified, measured, and communicated to serve this function, it is first necessary, but not sufficient, to know the nature of the judgments and decisions that are to be based upon this information. It is submitted here that the fundamental character of all judgments and decisions, based upon past data reported in published annual financial reports, is anticipatory. The past is gone and cannot be recalled. The present is only a point in time, a point without dimension. Only events yet to occur can be affected by man. The future is the domain of concern.

It has been suggested that the domain of accounting be limited to present knowledge - knowledge in the present, about the past and the present - on the grounds that such knowledge serves as the basis of both judgments about past events and of plans to procure future events.[3] This suggestion does not deny the anticipatory nature of judgments. Even judgments about past events have as their purpose assistance in determining future action; otherwise such judgments would not be made. Likewise, any effort toward determining one's present position is impelled by anticipatory motives.

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[3]Raymond J. Chambers, Accounting, Evaluation and Economic Behavior (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1966), p. 97.

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As noted above, the current operating performance approach to the reporting of periodic income relies on the notion of usefulness. The term "useful" raises the question: "For what purpose?" To the extent there are opposed possible purposes for which the item labeled net income may be used, a dominant purpose must be selected. For example, in a circumstance in which there has been a recent turnover of managerial personnel, certain gains and losses recognized in the current period may clearly not be the result of action of the present management. If the amount labeled net income is to be used solely as an index for evaluating the present management, there can be little doubt that the "proper" income is determined by following the current operating performance approach assuming that all items considered to be "extraordinary" are both beyond the control of and not the result of action taken by the present management.

Of course, there is the problem of determining the "control and responsibility" of present management. But more importantly, we should recall our purpose in attempting to evaluate management in the first place: to serve as a guide to future action. If the gains or losses from, say, a long-term non-cancellable contract continue to occur in future periods, current operating performance income may be both a good evalua

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good evaluation of the present management and a poor predictor of the firm's earnings potential at the same time. Thus the item labeled net income may be used for more than one purpose. In this example, the two purposes are (1) to evaluate management and (2) to predict the future earnings of the firm.

Which purpose is dominant for "the user" of published financial statements in the above example? This depends in part upon the courses of action open to the user. If he can influence future management action, the current operating approach may be preferable. On the other hand, if future management action is given, even though unknown, to the user, either the modified all-inclusive, or the current operating performance concept may result in the more useful measure of income, i.e., the better predictor. For United States companies publishing financial statements, a passive role on the part of users is assumed for purposes of this study. As stated previously, the user group of concern are those who "place undue emphasis on a single measure." Except for this group there would be no controversy since all three concepts provide in one way or another for the disclosure of extraordinary items and prior year adjustments. But the fact is that the controversy does exist and the purpose of this study is to aid in finding a solution.

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2.3 The predictive ability criterion

The problem of evaluating alternative accounting measurements is not unique with respect to the accounting for extraordinary items and prior period adjustments. "Most, if not all, accounting controversies can be viewed as disputes over the relative merits of one measurement alternative versus another."[4] The American Accounting Association has viewed "usefulness of the information" as "the all-inclusive criterion." Beaver, Kennelly, and Voss[5] point out that historically, usefulness has been related to decision making which in turn raises two difficulties: (1) to define the decision model and (2) to specify how the decision variables are to be measured. Often one or more of the decision variables will be a probabilistic expectation of the occurrence of some future event. Thus an important relationship between predictions and decisions is drawn: "A prediction can be made without making a decision, but a decision cannot be made without, at least implicitly, making a prediction."[6]

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[4]William H. Beaver, John W. Kennelly, and William M. Voss, "Predictive Ability as a Criterion for the Evaluation of Accounting Data," Accounting Review, XLIII (October 1968), 675.

[5]Ibid.

[6]Ibid., p. 680.

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Since financial statement users' decision models can not at present be fully specified, evaluating the three income concepts in terms of their relative predictive ability is a potentially significant approach. To evaluate the three concepts in terms of their ability to predict future income requires only that we assume that expected future income is a parameter of the decision process, even though we know very little about how the users use this parameter in reaching their decisions. Thus the predictive ability criterion can be employed prior to further specification of decision models. This conclusion was reached by Beaver, Kennelly, and Voss as follows:[7]

> Because prediction is an inherent part of the decision process, knowledge of the predictive ability of alternative measures is a prerequisite to the user of the decision-making criterion. At the same time, it permits tentative conclusions regarding alternative measurements, subject to subsequent confirmation when the decision models eventually become specified. The use of predictive ability as a purposive criterion is more than merely consistent with accounting's decision-making orientation. It can provide a body of research that will bring accounting closer to its goal of evaluation in terms of a decision-making criterion.

The usefulness of an accurate estimate of future earnings is held to be self-evident. The American Accounting Association Committee to Prepare a Statement of Basic

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Accounting Theory expressed this notion as follows: "Almost all external users of financial information reported by a profit-oriented firm are involved in efforts to predict the earnings of the firm for some future period."[8] The committee also observed that "The past earnings of the firm are considered to be the most important single item of information relevant to the prediction of future earnings,"[9] and that "A person using financial statements as an aid in predicting future earnings has a right to demand from the accountant measurements of past earnings that supply as much relevant information as possible."[10] An even stronger statement concerning the purpose of income reporting was made by Robert Sprouse: "The primary purpose of the measurement of last year's income reported to investors is to provide a basis for predicting future years' income."[11]

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[8] American Accounting Association, Committee to Prepare a Statement of Basic Accounting Theory, <u>A Statement of Basic Accounting Theory</u>, p. 24.

[9] <u>Ibid</u>.

[10] <u>Ibid</u>.

[11] Robert T. Sprouse, "The Measurement of Financial Position and Income: Purpose and Procedure," <u>Research in Accounting Measurement</u>, R. K. Jaedicke, Y. Ijiri, and O. Nielsen (eds.) (Evanston, Illinois: American Accounting Association, 1966), p. 106.

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2.3.1 The question of forecast objective

A question may be raised as to what is meant by "predicting earnings" or "estimating earnings potential." It is the writer's position that the desired knowledge of the future concerns the total change in the shareholder's future economic interest in the entity. Thus, the relevant accounting measure of this objective is future all-inclusive income.

Support for this view of "earnings potential" can be advanced by examining the need for having an indication of "earnings potential." The ultimate criterion is usefulness. This notion raises the questions for whom and for what purpose. One such purpose relates to the valuation of a company's common stock:[12]

> . . .the valuation of most common stocks involves two principal steps or procedures. The first is the preparation of some estimate of the probable range of the earnings potential for the future. . . . The second step . . . is to establish a reasonable price for the estimated earning power. . . In the majority of cases the statistical record of past earnings reflected by the income (profit and loss) statements constitutes the starting point for the calculation of possible future earning power. . . . The objective (of any adjustments made by the investor) is to make the past record indicative to the greatest extent possible of the economic activities which seem most likely to prevail in the future.

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[12]Douglas A. Hayes, Appraisal and Management of Securities (New York: The Macmillan Company, 1956), pp. 284-85.

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In the above discussion of future economic activities there is no reason to assume that the investor desires to omit estimates of future economic activities simply because they may be labeled "special" or "extraordinary" by the company. It may be that such items are more difficult to estimate. Also such "earnings" may be valued at different rates and different techniques employed in their estimation, but they are not ignored.

A sensible approach toward the prediction of future earning power (defined to include all changes in the economic power, as measured by accounting, of the stockholders equity after capital adjustments) would be to divide the projection into at least two elements -- the normal and the extraordinary. However, there is ample evidence to suggest a widespread opinion that many users of financial statements focus only on the single figure designated as net income for the period. As pointed out previously, it is the very existence of this group of users that gives rise to the controversy since all three concepts recognize the need for full disclosure of the extraordinary nature of such items. The question then becomes, given this single figure fixation on the part of certain users, which single income figure for the current period best serves as an aid in predicting future changes in the accou

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An alternative view toward the question of what is meant by predicting earnings potential is to give primary concern to the predictability _per se_, of an income concept, i.e., to forecast future values of _an_ income from past values of that same income series. Under this view, past all-inclusive income would be used to predict future all-inclusive income, past modified all-inclusive would be used to predict future modified all-inclusive income, and past current operating income would be used to predict future current operating income.

Support for this alternative view lies in the notion that income can not exist, much less be reported, except as determined by accountants. Likewise it may be argued that market values are determined on the basis of reported earnings, i.e. that to the investing public, income _is_ that amount reported by the company as "earnings per share." In this regard an interesting question lying beyond the scope of this proposed study is raised: to what extent does the market value all-inclusive earnings or modified all-inclusive earnings in a different manner from that in which it values current operating earnings?

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For purposes of this study, "earnings potential" will be regarded from each of the two viewpoints discussed above, i.e. each of the three concepts of income will be examined for its tendency to generate data useful in making predictions of (1) future income of the same series and (2) future changes in the accounting measure of stockholders' equity after capital adjustments, i.e. all-inclusive income.

2.3.2 Limitations of the predictive ability criterion

The following limitations are not uniquely inherent in this approach but rather are apt to be encountered in any attempt to evaluate alternative accounting procedures according to any purposive criterion. However, it is desirable that the limitation of any research method be kept in mind in order to avoid drawing unwarranted inferences and/or generalizations.

The finding of predictive ability depend in part upon the particular prediction model(s) employed. In this study, two linear time series regression models were used. The models, which in the writer's opinion represent operationalized versions of intuitively perceived characteristics generally attributed to lesser sophisticated users of accounting information, varied only with respect to relative weights given to historical data and are fully specified in the following

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following chapter. It is important to note that it is impossible to test the income measure under examination separately from the prediction model employed. Positive results represent a joint confirmation of both the model and the income measure while negative results may be due to an "error" in either or both elements.

Another potential problem arises when results are positive (i.e. there is a significant difference in forecasting error between alternative income measures.) For example, assume income measures under the modified all-inclusive concept predict better than say, income measures under the all-inclusive concept when using a given model. If different weights are introduced into the forecast model the all-inclusive income measure might contribute more to the predictive power of the newly weighted model than income measures under the modified all-inclusive concept. Even if consistent results are observed for all models tested there is always the possibility that some untested model possesses still greater predictive power and at the same time suggests the opposite conclusion concerning the alternative income measures under study.

The evaluation of the relative predictive ability of the income measures may require an assumption concerning the loss functi

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loss function associated with prediction errors. For example, it may be that overforecast errors of future earnings are more damaging to the achieving of the users objectives than under-forecast errors of the same magnitude. The approach of this study was to present the distribution (regarding over and under forecasts) so that the reader might apply his own loss functions in choosing among the income measures.

After considering both the potential advantages and limitations of using the predictive criterion in an effort to contribute toward a solution to the problem to which this study is addressed, the writer is in complete agreement with Beaver, Kennelly, and Voss's concluding remarks.[13]

> Two implications emerge from the previous discussion: (1) The preference for an accounting measure may apply only within the context of a specific predictive purpose or prediction model. It may be impossible to generalize about the 'best' measurement alternative across different contexts. (2) Even within a specific context, the conclusions must be considered as tentative.
>
> The inability to generalize is a possibility, but not an inevitability. We have cited only _potential_ difficulties, whose relevance can only be assessed empirically, not by _a priori_ speculation. What is important is to know to what extent we can generalize across purposes, and the only hope of acquiring this knowledge is to conduct the predictive studies. _If we discover that different measures are best for_

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[13]Beaver, Kennelly, and Voss, "Predictive Ability as a Criterion for the Evaluation of Accounting Data," pp. 682-83.

<u>different purposes, it would be erroneous to believe that the predictive studies are any less important because of that discovery. The inability to generalize, if it does exist, is not a flaw of the predictive ability methodology. It merely reflects the state of accounting theory, but in neither case is it an indictment of the methodology that exposes that fact</u>. (Emphasis supplied.)

Even within a specific context, the preference for one measure over another is tentative. A measure that performed poorly may not be permanently rejected in the sense that the researcher may refine the measure (and its theory) or redesign the study in the hope that future research will demonstrate that the measure is really better. Also there is always the possibility of an unknown or untested measure that performs even better than the best measure tested. Theory construction in other disciplines is an evolutionary process, where the hypotheses are continuously being revised, redefined, or overturned in the light of new theory and new evidence. There is no reason to believe that accounting theory will be different.

Although it is important that a general awareness of these factors exists, neither the potential inability to generalize nor the tentative nature of the conclusions should be regarded as a deterrent to conducting the predictive studies. Extension of research efforts into the predictive ability of accounting data is necessary for the fulfillment of accounting's decision-making orientation and for the meaningful evaluation of alternative accounting measures.

2.4 Concepts versus practices

Thus far, three concepts of reporting income have been discussed. These have been referred to as the all-inclusive concept, the modified all-inclusive concept, and the current operating performance concept. As noted in Chapter I, the American Institute of Certified Public Accountants favored the current operating performance concept prior to Opinion No. 9. However, the preliminary review based on information reported in Accounting Trends & Techniques showed that practice was not consistent with any single concept during the period prior to Opinion No. 9. This observation is also consistent with the empirical findings of Arnett,[14] Bernstein,[15] and Wright.[16] Thus it becomes important to distinguish between a given concept and actual practice under the AICPA's advocacy of that concept. Therefore, this study was directed at evaluating the relative predictive ability of income measures under both two practices, as well as the three theoretical concepts.

The two practices under which income measures were examined are referred to as, the "as reported" practice and the "modified all-inclusive" practice. The "as reported" practice refers to income as actually reported by the sample firms over the periods of the test, whereas the determination

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[14] Harold E. Arnett, "Application of the Capital Gains and Losses Concept in Practice," Accounting Review, XL (January 1965).

[15] Bernstein, Accounting for Extraordinary Gains and Losses.

[16] Wright, Accounting for Extraordinary Charges and Credits and Their Implications for Net Income.

of income measures under the modified all-inclusive practice often required the recasting of published income statements to show how they would have appeared if APB No. 9 had been in effect. Because of the necessary exercise of judgment by the writer, the latter must therefore be viewed as simulated measures.

In fact, income measures under the modified all-inclusive concept are identical with those under the modified all-inclusive practice. The purpose in evaluating the relative predictive ability of income measures under each of these two practices was to attempt to measure the overall potential desirability of the AICPA position as reflected in Part I of Opinion No. 9, and thus contribute toward a solution to the seemingly endless stream of apparent paradoxes such as the following:

> The APB has chosen disclosure. . . rather than accuracy. . . . Their approach may tend to prevent attempted manipulation (but) it may also force. . . innocent distortion.[17]

2.5 Summary of the approach

The test of usefulness in evaluating a) concepts -- current operating performance, modified all-inclusive, and

[17] Corbin, "Reporting Unexpected Items: A Dissent to APB Opinion No. 9," p. 5.

all-inclusive -- and b) practices -- "as reported" and modified all-inclusive -- reduces to a test of their relative ability to generate data more useful in making future predictions of "income". Unless at least one of these concepts or practices can be shown to be of greater use in this respect, the criterion of predictive assistance is irrelevant to the controversy. This would destroy the arguments grounded in "usefulness," for both the current operating performance (and its realized resultant -- the "as reported" practice) and all-inclusive concepts. The burden of proof is upon these concepts (and practice) because they are dependent upon a specified use of the resulting information. In contrast, the modified all-inclusive alternative seems clearly superior on the basis of a priori accounting theory.

As mentioned previously, two prediction models were employed during the process of comparing the relative predictive ability of (1) the three income concepts and (2) the two income practices. Also two forecast objectives were used for each of these comparisons. Thus for each set of data there were four comparisons of resulting forecast errors due to the four possible combinations of prediction models and forecast objectives as indicated by the following illustration.

FIGURE 1

COMPARISONS OF FORECAST ERRORS
GENERATED FROM EACH DATA SET

	Prediction Model I (unweighted linear regression)	Prediction Model II (weighted linear regression)
Forecast Objective A (all-inclusive income)	Comparison of 3 concepts Comparison of 2 practices	Comparison of 3 concepts Comparison of 2 practices
Forecast Objective B (income under same concept or practice)	Comparison of 3 concepts Comparison of 2 practices	Comparison of 3 concepts Comparison of 2 practices

In addition comparisons were made with respect to forecast amounts as indicated by Figure 2.

FIGURE 2

COMPARISON OF FORECAST AMOUNTS

Prediction Model I	Prediction Model II
Comparison of 3 concepts	Comparison of 3 concepts
Comparison of 2 practices	Comparison of 2 practices

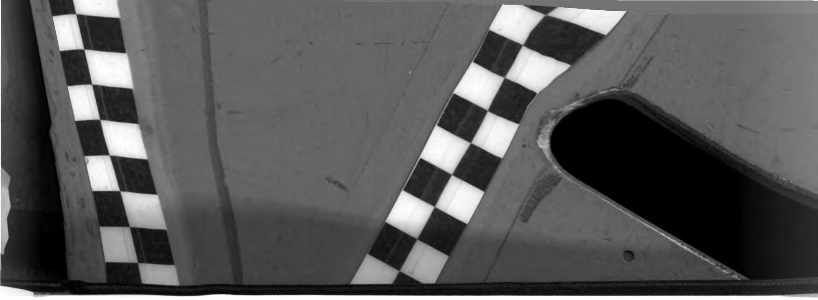
The purpose of these illustrations is only to summarize the basic approach used during the course of this study. The following chapter describes the methodology in detail.

2.6 Hypotheses

The following hypotheses were tested by the methodology set forth in the subsequent chapter. The hypotheses can be divided into two groups (1) those (C.1 - C.2) concerned with comparisons between income reporting concepts and (2) those (P.3 - P.6) concerned with income reporting practices. Hypothesis C.1 is concerned with whether, among the three income concepts, there is any consistent significant difference as to which income measure resulted in better forecasts with the *a priori* expectation being that the current operating performance concept would generate better forecasts than either of the other two concepts since all items deemed extraordinary are excluded therefrom. Hypothesis C.2, also concerned with the three concepts, involves comparisons of forecast amounts in order to ascertain whether any concept can be considered more conservative than the others. Hypotheses P.3 and P.4, responsive to both frequencies and relative amounts, parallel hypothesis C.1 with respect to the two practices while hypotheses P.5 and P.6 parallel hypothesis C.2.

The hypotheses were as follows:

Hypothesis C.1 H_o: the probability of a better prediction (i.e. a lesser absolute forecast error) is the same for predictions generated from income measures under each of the three income concepts. H_a: the probabilities of a



better prediction are greater with the current operating performance concept.

Hypothesis C.2 H_o: the probability of a lesser prediction is the same for predictions generated from income measures under each of the three income concepts. H_a: the probabilities of a lesser prediction differ according to the income concept.

Hypothesis P.3 H_o: the probability of a better prediction is the same for predictions generated from income measures under each of the two income reporting practices. H_a: the probabilities of a better prediction are greater with the "as reported" practice.

Hypothesis P.4 H_o: the aggregate predictive ability of the "as reported" practice and the modified all-inclusive practice do not differ. H_a: the aggregate predictive ability of the "as reported" practice is greater.

Hypothesis P.5 H_o: the probability of a lesser prediction is the same for predictions generated from income measures under each of the two income reporting practices. H_a: the probabilities of a lesser prediction are greater with the "as reported" practice.

Hypothesis P.6 H_o: the probability of lesser aggregate predictions is the same for predictions generated from income measures under the "as reported" and modified all-inclusive practices. H_a: the probabilities differ according to the income practice.

CHAPTER III

METHODOLOGY

3.1 Overview

The basic means by which the relative predictive ability of the two income practices and three income concepts was evaluated was by comparing the associated relative forecast error measures. All comparisons were between forecast error measures associated with various income measures for the same company for the same accounting period, i.e., the forecast error associated with income measure A for Company XYZ in the year 1960 was compared with the forecast error associated with income measure B for Company XYZ in the year 1960; there was no comparison with any measure associated with, say, Company ZZZ, nor was there any comparison with any measure associated with Company XYZ's 1962 operations. Thus all extraneous variables which might have influenced the outcome of any of the individual comparisons were eliminated.

Two groups of comparisons were made: (a) those between forecast error measures associated with income measures obtained under each of three income concepts and (b) those between forecast error measures associated with income measures o

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measures obtained under each of two income practices. For each group, a comparison was made for each of 76[1] companies, for each of 16 time periods, and under each of 4 combinations of forecast model and forecast objective. These combinations are represented graphically in Figure 1.

Once the sample was selected and the raw data obtained, the methodology followed during the course of this study can be divided into three processes: determining earnings per share on each of four bases; determining forecast errors; and evaluating the significance of the resulting forecasts and forecast error measures. The first two processes (groups of procedures) are described in the subsequent pages of this chapter while those procedures related to evaluation are set forth in Chapter IV along with the findings generated thereby.

3.2 Sample selection

A random sample of 76 companies[2] was selected from

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[1]Exception: for the single most recent of the 16 time periods, data were not available for 8 companies.

[2]Sample size was determined as follows. From Table I (of Chapter I) it was noted that the percentage of companies reporting one or more extraordinary items ranged from 20 per cent in 1966 to 40 per cent in 1956 with the average for the period 1956-66 being 34 per cent. Assuming the companies reported upon in Table I to be representative of the universe of this study, it appeared that a sample size of approximately 76 would be adequate in order to obtain (for each year) a minimum of 15 companies reporting one or more extraordinary items.

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among those companies whose common stock was traded upon the New York Stock Exchange during the calendar year 1946. Further requirements for inclusion in the sample were (1) that the company still be in existence as of January 1, 1968, (2) that its common stock continue to be listed on the New York Stock Exchange as of that date, (3) that the company not be primarily engaged in the areas of transportation, communication, utility services, finance, or insurance since the accounting practices of such companies are governed by regulatory agencies, and (4) that the nature of the company's operations must not have undergone a total change[3] during the time period 1947 through 1967. A list of the companies included in the sample is presented as Appendix A.

The procedure employed in selecting the sample was as follows. A copy was obtained of the listing "1946 Stock Market Dealings" as published in _The New York Times_,[4]

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[3]In order to clarify what is meant by a total change in a company's operations, the only two examples encountered during the course of this research were International Mining Corporation (formerly National Department Stores Corp.) whose operations changed from retailing to mining, and Madison Square Garden Corporation (formerly Graham-Page Corporation) whose operations changed from the manufacture of automobile parts to the operation of an amphitheater.

[4]"1946 Stock Market Dealings," _The New York Times_, January 2, 1947, sec. L, p. 36.

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January 2, 1947. Each item on this list was numbered consecutively from 1 to 1,340. A random sample of numbers falling within the range of 1 to 1,340 (inclusive) was selected by reference to "Appendix VII Random Numbers" of Schaum's Outline of Theory and Problems of Statistics.[5] If and only if the item corresponding to this number met the requirements described above, was it included in the sample. It was necessary to examine 219 listings in order to obtain a sample of 76. A breakdown of the 143 rejections is as follows:

Preferred stocks and class B issues	66
Mergers and acquisitions	32
Delistings	15
Liquidations	6
Non-qualifying industries	22
Changes in operations	2
	143

It should be noted that companies were not omitted from the sample as a result of name changes. Distinctions between name changes and the creations of new entities were based on information reported in various editions (covering the 1946 to 1968 time span) of Moody's Industrial Manual,[6] Moody's

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[5] Spiegel, Murray R., "Appendix VII Random Numbers," Schaum's Outline of Theory and Problems of Statistics (New York: Schaum Publishing Co., 1961), p. 349.

[6] Moody's Industrial Manual (New York: Moody's Investors Service, Inc., 1946 through 1968.)

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Public Utility Manual,[7] _Moody's Transportation Manual_,[8] and _Moody's Bank & Finance Manual_.[9]

The procedure employed in classifying companies (for the purpose of deciding which ones were to be included in the sample) with respect to industry was as follows. Each company listing in the "Corporation Directory" section of _Poor's Register of Corporations, Directors and Executives-1968_[10] shows the Standard Industrial Classification code number (S.I.C.) for the principal products manufactured or the major services furnished by the company in question. The first two digits of this four digit S.I.C. number show in which of ten major divisions the company is classified. S.I.C. numbers were not used in pre 1960 editions of _Poor's Register of Corporations, Directors and Executives_; however a short verbal description of the company's principal product or business is given. The S.I.C. number reported in 1968

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[7] _Moody's Public Utility Manual_ (New York: Moody's Investors Service, Inc., 1946 through 1968).

[8] _Moody's Transportation Manual_ (New York: Moody's Investors Service, Inc., 1946 through 1968).

[9] _Moody's Bank and Finance Manual_ (New York: Moody's Investors Service, Inc., 1946 through 1968).

[10] _Poor's Register of Corporations, Directors and Executives - 1968_ (New York: Standard & Poor's Corporation, 1968).

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along with verbal descriptions of 1959 and 1949 were used to classify each company into one of the ten major divisions used by the Standard Industrial Classification System.

3.3 Data source

The published annual reports of each company included in the sample for fiscal periods ending December 31, 1947 and subsequent provided the source data for this study. This procedure called for the examination of a total of 1,596 annual reports. Reports for eight companies covering the year "1967" were not yet available at the time this data was being collected. Also the 1947 annual report for one company could not be located. With these exceptions, all data collection was based upon examination of original source documents, i.e. published annual reports of the companies. A total of 1,587 documents was examined.

Reports for fiscal periods ending from December 31, 1947 to November 30, 1948 (inclusive) were labeled "1947", those covering fiscal periods ending from December 31, 1948 to November 30, 1949 were labeled "1948", etc. (In applying the above criterion a latitude of seven days was allowed in order to accommodate those firms reporting on the basis of a 52-53 week fiscal period.) As a result, this study covered the 20 year time span immediately preceding the effective

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effective date (for annual fiscal periods) of APB Opinion No. 9 which became effective for fiscal periods beginning after December 31, 1966. Annual reports for "1967" were also included to the extent available (68 of the 76 companies) at the time these data were being collected. The purpose of including this period was to allow for comparisons before and after APB Opinion No. 9 became effective.

The financial statements examined for purposes of this study were those included in the company's published annual report to stockholders. In those cases in which both a detailed and condensed report was prepared for a single year, a single report was examined. The criteria for selecting which report to examine were as follows:

1. The financial statements must have been audited as evidenced by the inclusion of the auditor's opinion in the annual report to stockholders.

2. The report must have been sent to stockholders by the company without the stockholder making a specific request to receive it.

3.4 Procedures for determining earnings per share

Since the individual investor's forecast objective relates to his individual share in the company's future earnings potential, all income measures used in this study were stated in terms of earnings per share. Earnings per common share, af

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share, after adjustments for stock splits and stock dividends, were determined for each fiscal period in the 21 year test period (1947-1967) for each company on each of the following basis:

(A) As reported in the annual report

(B) Current operating performance

(C) Modified all-inclusive (per APB Opinion No. 9)

(D) All-inclusive

It will be recalled that income measures B, C and D represent the three income <u>concepts</u> whereas A and C represent the two income <u>practices</u>. The procedure followed was to classify all accounts reported on either the income statement or the statement of retained earnings as either capital adjustment or transaction, normal income determinant, extraordinary income determinant, prior period adjustment-old, or prior period adjustment-new. The following relationships were then used to determine the various income measures:

$$CUR - (XDET + PPA_o) = MOD - PPA_n = ALL$$

where CUR = Current operating performance income
XDET = Extraordinary income determinants
PPA_o = Prior period adjustments-old*
MOD = Modified all-inclusive income
PPA_n = Prior period adjustments-new*
ALL = All-inclusive income

*These terms are defined in Section 3.4.2

Forms used for the purposes of collecting data and determining income measures have been reproduced as Appendices B, C, and D.

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3.4.1 Adjustment for stock dividends and splits

Adjustments were made for stock dividends and/or stock splits. The procedure employed that amount reported as earnings per share for the year 1967 as a standard of comparison. An adjustment factor which was applied to that amount originally reported as earnings per share was determined for each company for each year of the test period by use of the following formula:

$$Adj_{1967-n} = 1 \cdot \frac{1}{1+P_1} \cdot \frac{1}{1+P_2} \cdot \frac{1}{1+P_n}$$

where $P_1, P_2, \ldots P_n$ = Number of new shares received as a stock dividend or in a stock split expressed as a percentage of the number of shares previously held, for splits and stock dividends occurring during the year 1967 - n.

3.4.2 Identification of "items"

The term "item" was used to refer to an extraordinary income determinant, prior period adjustment-old, or prior period adjustment-new. When examining financial statements, the following criteria were used in determining what constitutes an "item".

Accounts appearing on the statement of retained earnings or earned surplus were regarded as an "item" unless they fell into one of the following classifications: earnings distribut

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Accounts appearing on the income statement were evaluated as follows in deciding whether an "item" exists:

1. An account was considered as being an "item" if one or more of the following terms were used in either the title of the account or in the title of the caption under which the account is reported: extraordinary, special, nonrecurring, abnormal, prior period, or prior year. It should be emphasized that the terms "other income or expense", "non-operating", and "from other sources" are not included herein.

2. An account was considered as being an "item" if it falls within any of the following classifications with respect to its nature:
   - (A) Disposal or sale of:
     - Property, plant, and/or equipment
     - Investments or securities
     - Subsidiary, affiliate, or division
   - (B) Change in valuation bases:
     - Inventory write-down to market
     - Change in investment valuation
     - Other property, plant, and equipment adjustments
     - Lifo liquidation or replacement
   - (C) Expenses, losses, gains, etc.:
     - Foreign exchange adjustments
     - Nonrecurring plant expense
     - Discontinued operations
   - (D) Extraordinary depreciation

3. An account was not considered as an "item" if it meets neither of the two criteria described above.

Having identified an "item", its classification as extraordinary income determinant, prior period adjustment-old, and prior period adjustment-new was based upon the criterion that for an "item" to be considered as a prior period adjus

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period adjustment-new, it must meet the criteria set forth in APB Opinion No. 9. For an "item" to be considered as a prior period adjustment-old, restatement must have been made for prior years' reported income in the company's published annual report. It should be noted that an individual "item" could be both a prior period adjustment-old and a prior period adjustment-new. All other "items" were regarded as extraordinary income determines.

3.4.3 Adjustments for periods not of the duration of one calendar year

It was observed that in a small minority of cases, companies' annual reports cover periods of duration other than one calendar year. This situation was the result of either the use of a 52-53 week reporting period or a change in the company's annual closing date. In the former case no adjustments were made for a slight deviation from a calendar year since any resulting distortion would be of insignificant magnitude for purposes of this study. However, for the latter case, an adjustment was made in order to obtain comparability of data relating to this period with data of other periods. The procedure for making this adjustment is described as follows.

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ending during the calendar year on a date other than within seven days of December 31, was designated as being associated with the preceding calendar year, i.e. a report covering a fiscal period extending into two calendar years was associated with the earlier calendar year for identification purposes. As a result it was possible that a change in a company's annual closing date could have resulted in either zero, one, or two reports being identified with a given calendar year. However, for all such changes relevant to this study, this procedure resulted in at least one report being associated with each calendar year for each company. In those instances in which two reports were so identified with a single calendar year, all flow measures contained in the two reports were combined and regarded as being associated with a single period equal in duration to the sum of the durations of the two periods covered by the two separate reports.

The adjustment procedure followed for all calendar years in which the associated report or reports covered six months or more was one of annualization, i.e. flow measures were adjusted by multiplying by a fraction in which the numerator is 12 and the denominator is the number of calendar months covered in the report or reports identified with the calendar year in question.

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3.4.4 Determination of income tax effects of "items"

The purpose of this study was to determine, examine, and compare four measures of income, termed herein: "as reported," all-inclusive, modified all-inclusive, and current operating performance. For a given company in a given year, each "item" disclosed in the financial statements was reported as either a determinant of that amount designated as "net income for the period" or subsequent to the determination of that amount. Thus, in order to determine the four income measures the following conversions had to be made:

(A) From current operating performance basis to all-inclusive basis. This involved adding the reported amount of each "item" to that amount originally reported as net income.

(B) From current operating performance basis to modified all-inclusive basis. This involved the same procedure as used in conversion A above except that it was limited to those "items" which did not meet the criteria for prior period adjustments as set forth in APB Opinion No. 9.

(C) From all-inclusive basis to current operating performance basis. This involved deducting the amount of each "item" on a net of tax basis from that amount originally reported as net income.

(D) From all-inclusive basis to modified all-inclusive basis. This involved the same procedure as used in conversion C above except that it was limited to those "items" which meet the criteria for prior period adjustments as set forth in APB Opinion No. 9.

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(E) From modified all-inclusive basis to current operating basis. This involved the same procedure as used in conversion C above except that it was limited to those "items" which did not meet the criteria for prior period adjustments as set forth in APB Opinion No. 9.

(F) From modified all-inclusive basis to all-inclusive basis. This involved the same procedure as used in conversion A above except that it was limited to those "items" which meet the criteria for prior period adjustments as set forth in APB Opinion No. 9.

It should be noted that conversions A, B, and F above required simply that the amount of the item in question be taked as reported. However, conversions C, D and E often required an estimation of the income tax consequence of the "item" in question in order to approximate the net of tax effect on reported net income. Hence, the following procedure[11] was employed in and only in performing conversions C, D, and E above:

Step 1. If the tax effect of the "item" was disclosed in the annual report, that amount as reported was used. Otherwise, the procedure employed was as described below.

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[11]Reference was made to the following sources in developing this procedure: Bruton, Paul W. and Bradley, Raymond J., Federal Taxation (St. Paul, Minn: West Publishing Co., 1955); Commerce Clearing House, Inc., 1957 U.S. Master Tax Guide and 1967 U.S. Master Tax Guide, (Chicago, Ill: Commerce Clearing House, Inc., 1957 and 1967); and Montgomery, Robert H., Montgomery's Federal Taxes - Corporations and Partnerships - 1947-48 Vol. I - Gross Income and Deductions (New York: Ronald Press Company, 1948).

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Step 2. If specific information disclosed in the annual report could be used to determine the tax effect, the tax effect of the "item" in question was determined on this basis. Otherwise, the procedure employed was as described below.

Step 3. A limit equal to the amount of the income tax expense reported for the year, was observed when employing the following estimation procedures. Thus if there were no income tax expense for the year in which the "item" was reported, the tax effect of the "item" was regarded as zero, i.e. loss carrybacks and/or carryforwards were not considered. If and only if a positive tax expense was reported, was the procedure described below employed.

Step 4. From the information contained in the annual report, the "item" in question was classified as one of the following:

(a) Ordinary gain or loss
(b) Capital gain or loss
(c) Gain or loss on property used in trade or business

Step 5. (A) For ordinary gains and losses, the tax effect was estimated by multiplying the amount of the "item" times the average tax rate, i.e. that ratio existing between the reported income tax expense for the year and reported net income before tax.

(B) For capital gains, the tax effect was estimated by multiplying the amount of the item times 25 per cent, the alternative capital gains tax rate existing for corporations over the entire time period under consideration in this study, i.e. from January 1, 1947 to date. For net capital losses, the tax effect was considered to be zero.

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(C) For net losses on property used in trade or business, the income tax effect was estimated in the same manner as for ordinary gains and losses. For net gains on property used in trade or business, the procedure for estimating tax effects gave recognition to the depreciation recapture provisions of United States Federal Income Tax Law which generally became effective for taxable years beginning after December 31, 1962. The procedure was to estimate the tax effect of these gains reported in "1947" through "1962" in the same manner as that used for capital gains. However, for such gains occurring subsequent to "1962" the rate applied to the gain was selected from the following schedule (arbitrarily determined) according to the period covered by the financial statements in which the gain is reported:

1963	.34	1966	.42
1964	.37	1967	.44
1965	.40		

Several points should be emphasized concerning the above procedures for estimating income tax effects. First, tax effects were relevant only where the "items" in question were originally reported as a determinant of income. This was the case for 503 out of a total of 1,033 "items" examined during the course of this study. Secondly, reported amounts were used when reported. The estimation procedures were employed only where there was no alternative. This was the case for 303 out of the 503 items originally reported as a determ

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3.5 Procedures for determination of forecast errors

Before beginning this section the reader is directed to Figure 3 for an overview of the procedures described in detail below. To evaluate the relative predictive significance of the various income measures, series of such measures were used as inputs to two least-squares linear regression models. Earnings per share (as adjusted for stock dividends and splits and, where appropriate, for prior period adjustments) for the firm's most recent five years, were used to determine the parameters for the model from which a forecast was made for the following year. After making the forecast for each year, the linear trend line of best fit was recalculated by incorporating actual earnings per share for the following year (based on the income concept under examination) and omitting the earnings per share for the sixth most recent year. Also, for certain income measures, any prior period

FIGURE 3

DETERMINATION OF PERCENTAGE FORECAST ERROR MEASURES

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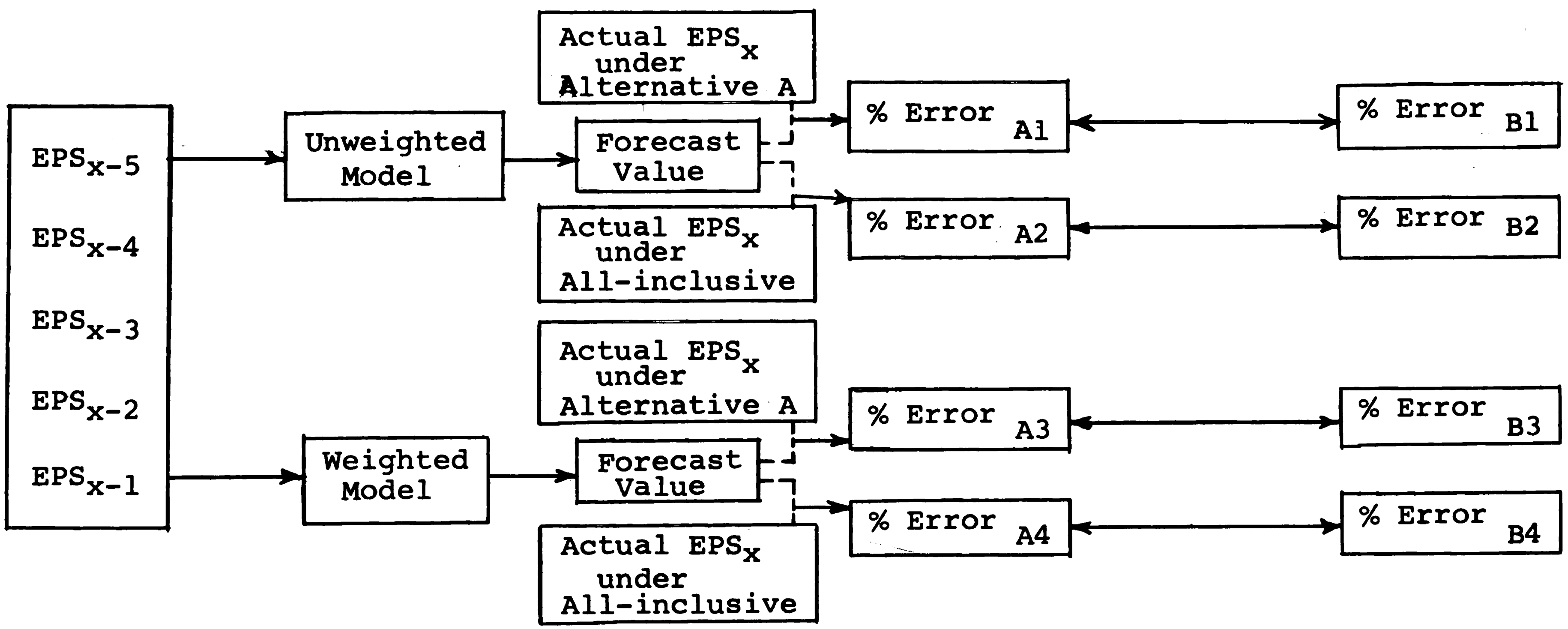
FIGURE 3

DETERMINATION OF PERCENTAGE FORECAST ERROR MEASURES

Income Reporting Alternative A				Comparison	Income Reporting Alternative B
EPS Figures for the preceding 5 years are used as inputs	To two different prediction models.	The 2 resulting forecasts for year X are related to 2 different actual values for year X	Resulting in 4 different percentage forecast error measures for the year X,	Which are then compared with	Similarly derived percentage forecast error measures based upon alternative EPS figures.



adjustments (old or new, depending upon the income measure under examination) reported in the most recent year were used to adjust earnings per share for the appropriate prior year(s) with the recomputed trend being based on the preceding five years as adjusted. In short, each forecast was based on income measures associated with the immediate five years including the effect of, where appropriate, prior period adjustments, if any, to the extent that such items were reported prior to the year for which a forecast was being made.

The two forecasting models were as follows. One was a least-squares linear regression model in which earnings per share figures for each of the five previous years was given equal weight. The second was similar to the first except that in making the regressions, earnings per share for the most recent year was given a weight of 5; earnings per share for the second most recent year was given a weight of 4, for the third most recent year a weight of 3, for the fourth most recent year a weight of 2, and for the fifth most recent year a weight of 1.

Forecast values, as derived from each of the four income reporting alternatives were then compared to each of the following actual values: (1) earnings per share of the same income series and (2) earnings per share based on the

all-inclusive concept of income. The dollar difference between the forecasted value and the "actual" value was then expressed as a signed (positive or negative) percentage of the absolute value of the relevant "actual" value in order to (1) avoid distortions due to differences in per share income levels and (2) maintain an indication of whether the forecast value was greater or less than the actual value. These signed ratios constitute the "forecast error measures" which were then evaluated as described in Chapter IV.

3.5.1 Restatements for prior period adjustments

Earlier it was noted that where appropriate, prior period adjustments were used to restate the earnings per share of prior years, upon which the forecasts are based. The purpose of this procedure was to give effect to the practice (recommended in APB Opinion No. 9) of including historical summaries in published annual reports which provide investors with a convenient source of data for making earnings predictions.

It will be recalled that the objective of this study was to determine which of several income measures would have been (for the test period) of greatest aid in forecasting some measure of earnings potential. Also, it will be recalled that under the modified all-inclusive concept of income as set forth by APB Opinion No. 9, the criteria for an item constituting a prior period adjustment differ significantly from those used formerly. Thus restatements of prior years' earnings per share due to prior period adjustments were varied depending upon the measure of income being evaluated. To be specific, no restatements were made for prior period adjustment when generating forecasts from earnings per share figures based upon the all-inclusive or current operating performance measures of income. Restatements for prior period adjustments-new as defined by APB Opinion No. 9 were made for generating forecasts with the modified all-inclusive income measures. Restatements were made for prior period adjustments-old, i.e. those so treated in published annual reports, when generating forecasts from earnings per share figures as originally reported after adjustment for stock splits and dividends.

CHAPTER IV

EMPIRICAL FINDINGS

4.1 Overview

The empirical findings of this study are set forth in the three major sections of this chapter. Specifically, this chapter contains only a statement of the empirical findings of the study. A discussion of their significance and the resulting implications for accounting practice is deferred to Chapter V.

Section 4.2 includes *descriptive statistics* concerning the forecast error measures associated with each of the four income measures. Section 4.3 includes a description of the procedures and findings relative to evaluating the significance of the forecasts and resulting forecast error measures under each of the *three income concepts*. Section 4.4 includes a description of the procedures and findings relative to evaluating the significance of the forecasts and resulting forecast error measures under each of the *two income practices*.

Figure 3 (in conjunction with Figure 1 of Chapter II) gives a graphic outline of the comparisons reported upon in

Sections 4.3 and 4.4. Figure 4 can be viewed as single cells of Figure 1 and Figure 2.

FIGURE 4

OUTLINE OF COMPARISONS

Comparison of	Criteria of Comparison: Best, i.e. lesser absolute percentage forecast error	Criteria of Comparison: Most conservative, i.e., lesser forecast
3 Concepts:		
CUR-MOD-ALL	Section 4.3.1	Section 4.3.2
CUR-MOD	4.3.1a	4.3.2a
CUR-ALL	4.3.1b	4.3.2b
2 Practices:		
REP-MOD	4.4.1a&b	4.4.2a&b

Codes used: ALL = All-inclusive
CUR = Current operating performance
MOD = Modified all-inclusive
REP = "As reported"

4.2 Descriptive statistics

Table IV shows for each year, for each four year period, and for the total period studied, the mean absolute percentage forecast error measure associated with each of the four income measures for the 76 companies sampled, where each income measure is examined under all possible combinations of the two prediction models and the two forecast objectives. Each annual mean figure ($\overline{M}_j$) was determined according to the

following formula:

$$\overline{M}_j = \frac{\sum_{i=1}^{76} \frac{F_{ji} - A_{ji}}{A_{ji}}}{76}$$

where j = year
i = number of the company.
F_{ji} = forecast amount for year j for company i.
A_{ji} = actual amount for year j for company i.

Table V shows for each year, for each four year period, and for the total period studied, the <u>average deviation</u> of absolute percentage forecast error measures associated with each of the four income measures for the 76 sample companies, where each income measure is examined under all possible combinations of the two prediction models and the two forecast objectives. The annual average deviation figures ($\overline{MD}_j$) were determined according to the following formula:

$$\overline{MD}_j = \sum_{i=1}^{76} \left| \frac{E_{ji} - \overline{M}_j}{76} \right|$$

where j = year
i = number of company

$$E_{ji} = \left| \frac{F_{ji} - A_{ji}}{A_{ji}} \right|$$

In order to assist the reader in analyzing the data of Tables IV and V, Table VI was prepared. Table VI shows by year and within each of the four possible combinations of

predictive model and forecast objective, the relative ordinal rank of both the means and average deviations of the forecast error measures associated with each income measure. The rank of 1 is assigned to the mean or average deviation of least magnitude (i.e. "best"), the rank of 2 is assigned to the next "best", and so forth. Sums of these ranks are also shown and when ranked give a measure of the overall rank of the various income measures with respect to specified characteristics of the resulting forecast error measures.

The following observations are based upon the data of Tables IV, V, and VI:

(1) There is a lack of consistent support for either of the two prediction models, i.e. neither model consistently resulted in better forecasts.

(2) The choice of forecast objective resulted in no consistent effect upon forecast error.

(3) It would appear there is in general a greater effect upon forecast error resulting from changes in time periods than from changes in either prediction models, forecast objectives, or income measures.

(4) Over the entire period, the "as reported" and "current operating performance" measures resulted in "better" forecasts than did the "modified all-inclusive" and "all-inclusive" income measures. This statement is based solely on the sums of the annual ordinal ranks of the means and mean deviations of the forecast errors associated with each of the income measures.

(5) There was a significant positive correlation between the ordinal ranks of the means and the ordinal ranks of the average deviations. In fact, for 194 out of the 256 cells in Table III, or 75.8%, the rank of the mean was identical with the rank of the average deviation.

Table VII shows for each year, for each four year period, and for the total period studied, the percentage of companies for which each of the four income measures resulted in a forecast in excess of the related "actual", where each income measure is examined under all possible combinations of the two prediction models and the two forecast objectives. The following observations are set forth for emphasis:

(1) Neither of the two prediction models seems to result in overforecasts more frequently than the other.

(2) The choice of forecast objective results in no consistent effect upon forecast error.

(3) None of the four income measures seems to result in overforecasts more frequently than the others.

(4) It would appear there is a greater effect resulting in changes in time period than from changes in either prediction models, forecast objectives, or income measures.

(5) For the test period as a whole there was an overall tendency for each of the four income measures to result in more underforecasts than overforecasts. This situation prevailed under all possible combinations of prediction models and forecast objectives.

TABLE IV

MEANS OF ABSOLUTE PERCENTAGE FORECAST ERROR MEASURES
FOR ALL COMPANIES FOR EACH OF FOUR INCOME MEASURES

Model:	Unweighted				Unweighted				Weighted				Weighted			
Objective:	Same Series				All-inclusive				Same Series				All-inclusive			
Measure:	As Reported	Current Operating Performance	Modified All-inclusive	All-inclusive	As Reported	Current Operating Performance	Modified All-inclusive	All-inclusive	As Reported	Current Operating Performance	Modified All-inclusive	All-inclusive	As Reported	Current Operating Performance	Modified All-inclusive	All-inclusive
1952	55	59	55	59	59	60	58	59	53	58	55	57	57	58	56	57
1953	63	42	66	44	62	39	64	44	53	38	55	44	53	36	54	44
1954	83	93	99	98	84	83	98	98	74	103	90	93	76	76	90	93
1955	49	51	52	52	53	51	51	52	48	49	52	51	52	49	50	51
1952-55	63	61	68	63	64	58	68	63	57	62	63	61	60	55	63	61
1956	165	139	185	167	159	131	172	167	167	136	188	171	165	32	176	171
1957	66	59	82	119	115	92	120	119	65	60	79	118	112	88	116	118
1958	70	66	167	163	154	90	167	163	64	61	185	187	177	98	184	187
1959	62	57	164	164	61	54	165	164	58	56	185	184	58	55	185	184
1956-59	91	80	150	153	122	92	156	153	89	78	159	165	128	68	165	165
1960	52	40	379	528	847	525	382	528	58	53	623	555	152	136	626	555
1961	45	43	56	90	54	52	66	90	39	39	51	89	45	43	58	89
1962	432	437	104	113	99	97	104	113	467	472	101	110	96	97	102	110
1963	46	49	55	57	48	47	54	57	45	48	56	52	47	47	54	52
1960-63	144	142	149	197	262	180	152	197	152	153	208	202	85	81	210	202
1964	117	132	727	719	510	538	719	719	143	107	787	781	519	494	778	781
1965	29	31	37	45	38	39	37	45	23	24	30	35	32	33	30	35
1966	58	60	80	71	60	60	70	71	61	61	81	74	63	60	73	74
1967	46	2022	48	50	48	51	49	50	42	2019	44	46	44	49	45	46
1964-67	63	561	223	221	164	172	219	221	67	553	236	234	165	159	232	234
1952-67	90	211	148	159	153	126	149	159	91	212	167	166	110	91	168	166

TABLE V

AVERAGE DEVIATIONS OF ABSOLUTE PERCENTAGE FORECAST ERROR MEASURES
FOR EACH OF FOUR INCOME MEASURES

Model: / Objective:	Unweighted Same Series				Unweighted All-inclusive				Weighted Same Series				Weighted All-inclusive			
Measure:	As Reported	Current Operating Performance	Modified All-inclusive	All-inclusive	As Reported	Current Operating Performance	Modified All-inclusive	All-inclusive	As Reported	Current Operating Performance	Modified All-inclusive	All-inclusive	As Reported	Current Operating Performance	Modified All-inclusive	All-inclusive
1952	47	52	48	52	54	57	52	52	48	57	52	54	56	59	54	54
1953	71	39	71	38	69	32	69	38	58	35	57	39	54	29	54	39
1954	105	119	128	130	195	102	129	130	92	141	115	118	92	92	116	118
1955	37	39	39	36	38	36	36	36	40	41	43	39	42	38	40	39
1952-55	65	62	72	64	67	57	72	64	60	69	67	63	61	55	66	63
1956	253	201	283	250	237	184	258	250	261	200	294	262	252	191	270	262
1957	64	54	87	146	148	112	152	146	62	55	81	144	138	100	141	144
1958	66	61	223	217	205	97	224	217	63	58	267	267	255	115	268	267
1959	70	60	252	252	69	57	251	252	57	55	280	280	57	52	280	280
1956-59	113	94	211	216	165	113	221	216	111	92	231	238	176	115	240	238
1960	54	34	658	938	1569	953	658	438	63	54	1135	994	223	195	1134	994
1961	45	44	58	105	55	53	74	105	40	39	54	108	44	42	65	108
1962	776	774	144	154	133	132	146	154	854	851	145	154	136	136	146	154
1963	51	59	60	59	48	49	58	59	50	55	59	53	48	48	56	53
1960-63	232	228	230	314	451	297	234	314	252	250	348	327	113	105	350	327
1964	158	185	1303	1304	899	943	1304	1304	211	148	1425	1425	921	879	1426	1425
1965	22	25	33	44	32	33	33	44	17	19	26	32	27	30	26	32
1966	81	82	114	96	81	77	96	96	85	83	116	101	85	80	101	101
1967	46	3888	48	49	46	50	47	49	41	3890	42	42	41	47	42	42
1964-67	77	1045	375	373	265	276	370	373	89	1035	402	400	269	259	399	400
1952-67	122	357	222	242	237	186	224	242	128	362	262	257	155	134	264	257

TABLE VI

ORDINAL RANKING OF MEANS AND AVERAGE DEVIATIONS
AS SHOWN IN TABLES IV AND V

First digit indicates rank of mean from low to high values
Second digit indicates rank of mean deviation from low to high values

Model:	Unweighted				Unweighted				Weighted				Weighted			
Objective:	Same Series				All-inclusive				Same Series				All-inclusive			
Measure:	As Reported	Current Operating Performance	Modified All-inclusive	All-inclusive	As Reported	Current Operating Performance	Modified All-inclusive	All-inclusive	As Reported	Current Operating Performance	Modified All-inclusive	All-inclusive	As Reported	Current Operating Performance	Modified All-inclusive	All-inclusive
1952	11	33	12.	33	23	44	11	21	11	44	22	33	23	44	11	21
1953	33	12	43	21	33	11	43	22	33	11	44	22	33	11	43	22
1954	11	22	43	34	22	11	33	34	11	44	22	33	11	11	33	44
1955	11	23	33	32	44	11	11	31	12	23	44	31	44	11	23	32
1956	23	11	44	32	22	11	44	33	22	11	44	33	22	11	44	33
1957	22	11	33	44	23	11	44	32	22	11	33	44	22	11	33	44
1958	22	11	44	33	22	11	44	33	22	11	33	43	22	11	34	43
1959	12	21	33	33	22	11	43	34	22	11	43	33	22	11	43	33
1960	22	11	33	44	44	23	11	32	22	11	44	33	22	11	34	33
1961	22	11	33	44	22	11	33	44	12	11	33	44	22	11	33	44
1962	34	43	11	22	22	11	33	44	34	43	11	22	11	21	33	44
1963	11	22	33	42	21	12	33	44	11	23	44	32	11	11	44	33
1964	11	22	43	34	11	22	33	33	22	11	43	33	22	11	34	43
1965	11	22	33	44	21	32	12	44	11	22	33	44	22	33	11	44
1966	11	22	44	33	12	11	33	43	12	11	44	33	22	11	33	43
1967	11	44	22	33	11	44	22	33	11	44	22	32	11	44	22	32
Sum of Mean Ranks	25	31	49	51	34	26	44	51	26	31	51	50	31	25	46	54
Sum of MD Ranks	28	31	47	48	35	27	43	47	30	32	49	45	32	24	48	48

TABLE VII

PERCENTAGE OF COMPANIES FOR WHICH EACH OF FOUR INCOME MEASURES RESULTED IN OVERFORECASTS

Model:	Unweighted				Unweighted				Weighted				Weighted			
Objective:	Same Series				All-inclusive				Same Series				All-inclusive			
Measure:	As Reported	Current Operating Performance	Modified All-inclusive	All-inclusive	As Reported	Current Operating Performance	Modified All-inclusive	All-inclusive	As Reported	Current Operating Performance	Modified All-inclusive	All-inclusive	As Reported	Current Operating Performance	Modified All-inclusive	All-inclusive
1952	59	63	61	61	58	57	61	61	58	61	61	61	57	54	59	61
1953	34	36	39	41	37	36	39	41	34	34	38	39	34	36	38	39
1954	41	42	39	43	41	41	42	43	39	39	33	37	38	38	37	37
1955	21	18	20	22	21	18	21	22	24	21	25	26	24	17	26	26
1952-55	39	40	40	42	39	38	41	42	39	39	39	41	38	36	40	41
1956	42	42	42	41	37	37	41	41	51	51	51	51	46	47	51	51
1957	74	75	75	68	70	70	71	68	74	76	74	71	68	68	70	71
1958	71	74	67	67	68	68	67	67	70	70	64	66	67	66	64	66
1959	28	33	26	26	26	28	25	26	24	26	24	22	21	20	21	22
1956-59	54	56	53	51	50	51	51	55	55	56	53	53	51	50	52	53
1960	45	47	49	50	47	47	50	50	54	53	54	55	53	50	55	55
1961	53	53	54	54	53	50	53	54	59	58	59	59	58	54	58	59
1962	53	51	51	50	51	49	49	50	46	43	47	49	46	42	47	49
1963	38	38	33	37	36	34	33	37	36	36	32	37	33	33	32	37
1960-63	47	47	47	48	47	45	46	48	49	48	48	50	48	45	48	50
1964	20	17	21	21	17	14	22	21	21	18	21	24	20	17	24	24
1965	21	24	21	22	18	20	21	22	29	28	30	32	25	22	30	32
1966	34	36	37	38	36	34	37	38	39	41	41	42	41	37	41	42
1967	68	69	69	69	68	68	69	69	74	74	76	75	74	72	75	75
1964-67	33	37	37	38	35	34	37	38	41	40	42	43	40	37	43	43
1952-67	43	45	44	45	43	42	44	45	46	46	46	47	44	42	46	47

4.3 Procedures and findings relative to each of three income concepts

This section is divided into two sub-sections. Sub-section 4.3.1 concerns hypothesis C.1, i.e. it deals with comparisons relating to absolute amounts of forecast errors. Sub-section 4.3.2 concerns hypothesis C.2, i.e. it deals with comparisons relating to signed (positive or negative) amounts of forecasts.

4.3.1 Procedures and findings relative to evaluating the significance of absolute forecast errors

Null hypothesis: When comparing the results of employing different income concepts to a company for a time period, there is no difference in the expected number of lowest absolute forecast error measures associated with each of the income concepts, and any observed differences are merely chance variations to be expected in a random sample from the rectangular population where $f_1 = f_2 = f_3$. This is a more rigorous restatement of hypothesis C.1.

Alternative hypothesis: The frequencies f_1, f_2, and f_3 are not all equal.

Statistical test: Since this procedure involved comparing sample data with a presumed population, the goodness-of-fit type of statistical test is appropriate. The chi-square one-sample test was chosen because the hypothesis under test concerned a comparison of observed and expected frequencies in discrete categories. The categories were the three income concepts.

In order to acquaint the reader with the method of the chi-square one sample test, the following description is presented:[1]

> The null hypothesis may be tested by
>
> $$X^2 = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i}$$
>
> where O_i = observed number of cases categorized in ith category
>
> E_i = expected number of cases in ith category under H_o
>
> $\sum_{i=1}^{k}$ directs one to sum over all (k) categories
>
> (This) formula directs one to sum over k categories the squared differences between each observed and expected frequency divided by the corresponding expected frequency.
>
> If the agreement between the observed and expected frequencies is close, the differences $(O_i - E_i)$ will be small and consequently X^2 will be small. If the divergence is large, however, the value of X^2 as computed from (the) formula will also be large. Roughly speaking, the larger X^2 is, the more likely it is that the observed frequencies did not come from the population on which the null hypothesis is based.

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[1]Sidney Siegel, Nonparametric Statistics for the Behavioral Sciences (New York: McGraw-Hill Book Company, 1956), p. 43.

"In contemporary statistical decision theory, the procedure of adhering rigidly to an arbitrary level of significance, say .05 or .01, has been rejected in favor of the procedure of making decisions in terms of loss functions, utilizing such principles as the minimax principle (the principle of minimizing the maximum loss)."[2] However, for this study, as is the case with most research in the behavioral sciences, there is a lack of information concerning loss functions. Thus in order to allow the reader to reflect his own views regarding the "losses" or "gains" involved in achieving information of greater aid in making forecasts, probability levels associated with the chi-square statistics calculated from the observed data are presented in Table VIII. These figures indicate the probability of a statistic equal to or greater than the given chi-square statistic. Once the reader has determined his own significance level, he can turn to Table VIII to determine whether the null hypothesis is to be rejected for any given combination of time period, forecast model, and forecast objective.

Based upon an examination of Table VIII it is the writer's opinion that there is an "overall significance" in favor of the current operating performance concept of income

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[2] _Ibid._, p. 8.

TABLE VIII

CHI-SQUARE ONE-SAMPLE PROBABILITIES OF THE OBSERVED NUMBER OF COMPANIES FOR WHICH INCOME MEASURES UNDER EACH OF THREE INCOME CONCEPTS RESULTED IN LEAST ABSOLUTE FORECAST ERROR

Codes Used: ALL = All-inclusive concept
CUR = Current operating performance concept
MOD = Modified all-inclusive concept (Does not appear below since this concept never resulted in lowest absolute forecast error for plurality of companies.)

Model Objective:	Unweighted Same Series		Weighted All-inclusive		Weighted Same Series		Weighted All-inclusive	
Period:	Concept resulting in lowest absolute forecast error for plurality of companies	Probability	Concept resulting in lowest absolute forecast error for plurality of companies	Probability	Concept resulting in lowest absolute forecast error for plurality of companies	Probability	Concept resulting in lowest absolute forecast error for plurality of companies	Probability
1952	CUR	.5045	CUR	.0176	CUR	.5248	CUR	.0491
1953	CUR	.0039	CUR	.0759	CUR	.0139	CUR	.1082
1954	ALL	.8428	CUR	.1880	CUR	.4481	CUR	.0759
1955	CUR	.3020	CUR	.6146	CUR	.6146	CUR	.9120
1952-55	CUR	.0078	CUR	.0005	CUR	.0140	CUR	.0031
1956	CUR	.4141	ALL	.8102	CUR	.1606	CUR	.5248
1957	CUR	.0331	CUR	.0294	CUR	.3536	CUR	.0575
1958	CUR	.3020	CUR	.0575	CUR	.2683	CUR	.4481
1959	CUR	.2291	CUR	.3679	CUR	.0331	CUR	.3020
1956-59	CUR	.0032	CUR	.0130	CUR	.0008	CUR	.0106
1960	CUR	.0001	CUR	.0575	CUR	.0039	CUR	.1040
1961	CUR	.0016	CUR	.0139	CUR	.0083	CUR	.0294
1962	CUR	.0331	CUR	.0623	CUR	.0331	CUR	.1738
1963	CUR	.0007	CUR	.0623	CUR	.0012	CUR	.0491
1960-63	CUR	.0000	CUR	.0000	CUR	.0000	CUR	.0000
1964	CUR	.3536	CUR	.5248	CUR	.2791	CUR	.4481
1965	CUR	.3536	ALL	.9120	CUR	.0344	CUR	.7788
1966	CUR	.0039	CUR	.0294	CUR	.0575	CUR	.0623
1967	CUR	.2623	CUR	.0994	CUR	.1615	CUR	.2402
1964-67	CUR	.0006	CUR	.0225	CUR	.0003	CUR	.0158

reporting relative to the all-inclusive and modified all-inclusive concepts, with respect to associated absolute forecast errors. However, there is a possible explanation of this "overall significance" apart from a tendency of the current operating performance income measure to produce better forecasts than those generated with respect to either of the other two concepts. This "overall significance" could have been the result of relative extreme similarity between income measures under the all-inclusive and modified all-inclusive concepts, a situation which one could support on an <u>a priori</u> basis since, for current year figures, the only differences are prior period adjustments-new and only 118 such adjustments were involved in the sample data of this study.[3] In order to

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[3]For example, assume the following situation:

	Percentage Forecast Error		
Company No.	Current Operating Performance	Modified All-inclusive	All-inclusive
1	20	9	8
2	20	8	9
3	8	20	22
4	9	22	20

From this data current operating performance would appear "best" when comparing all three income concepts, i.e. it is "best" for 2/4 of the companies as compared to a "no difference" expectation of 1/3. However, if only the current operating performance and modified all-inclusive concepts are compared, the observed number of companies for which each concept is better = the "no difference" expectation = 1/2. This is also true when comparing only the current operating performance and all-inclusive concepts.

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eliminate this possible bias two additional sets of comparisons were made: one involving the current operating performance and modified all-inclusive concepts, and one involving the current operating performance and all-inclusive concepts. These procedures and findings are presented in the following two sub-sections.

4.3.1a Procedures and findings relative to comparing the current operating performance and modified all-inclusive concepts

Null hypothesis: When comparing the results of employing the current operating performance and modified all-inclusive concepts to a company for a time period, there is no difference in expected absolute forecast error associated with each of the two concepts. Relative magnitude as well as the direction of observed differences is considered, i.e. in terms of the Wilcoxon test, the sum of the positive ranks = the sum of the negative ranks.

Alternative hypothesis: The sum of the positive ranks $<$ the sum of the negative ranks, i.e. forecast error associated with the current operating performance concept will be lesser.

The Wilcoxon matched-pairs signed-ranks test was chosen because this hypothesis employs two related samples and involves two scores which can be ranked in order of absolute

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absolute magnitude, i.e. the absolute forecast error measures possess measurement characteristics in the strength of an ordered metric scale.

In order to acquaint the reader with the rationale and method of the Wilcoxon matched-pairs signed-ranks test the following description is presented.[4]

> Let d_i = the difference score for any matched pair, representing the difference between the pair's scores under the two treatments. Each pair has one d_i. To use the Wilcoxon test, rank all the d_i's without regard to sign: give the rank of 1 to the smallest d_i, the rank of 2 to the next smallest, etc. When one ranks scores without respect to sign, a d_i of -1 is given a lower rank than a d_i of either -2 or +2.
>
> Then to each rank affix the sign of the difference. That is, indicate which ranks arose from negative d_i's and which ranks arose from positive d_i's.
>
> Now if treatments A and B are equivalent, that is, if H_o is true, we should expect to find some of the larger d_i's favoring treatment A and some favoring B. That is, some of the larger ranks would come from positive d_i's while others would come from negative d_i's. Thus, if we summed the ranks having a plus sign and summed the ranks having a minus sign, we would expect the two sums to be about equal under H_o. But if the sum of the positive ranks is very much different from the sum of the negative ranks, we would infer that treatment A differs from treatment B, and thus we would reject H_o. That is, we reject H_o if either the sum of the ranks for the negative d_i's or the sum of the ranks for the positive d_i's is too small.

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[4]Sidney Siegel, Nonparametric Statistics For The Behavioral Sciences, p. 76.

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The findings of this test, along with certain descriptive data, are presented in Table IX.

4.3.1b <u>Procedures and findings relative to comparing the current operating performance and all-inclusive concepts</u>

The null hypothesis, alternative hypothesis, statistical test, and presentation of findings exactly parallel those of sub-section 4.3.1a and consequently will not be discussed here. The findings, along with certain descriptive data, are presented in Table X.

4.3.1c <u>Observations concerning Tables VIII, IX, and X</u>

The following observations are drawn from the data of Tables VIII, IX, and X.

(1) The choice of prediction model apparently has no consistent effect as to which income concept yields the smaller forecast error.

(2) The choice of forecast objective apparently has no consistent effect as to which income concept yields the smaller forecast error.

(3) Forecasts associated with the current operating performance concept involved smaller relative absolute error during the four year period 1960 through 1963 than during any other four year period covered by this study. It should be noted that for this four year period only, the null hypotheses were rejected at the .10 level for all three comparisons given any combination of forecast objective and prediction model.

TABLE IX

COMPARISONS (WITH RESPECT TO ABSOLUTE AMOUNTS) OF FORECAST ERRORS ASSOCIATED WITH INCOME MEASURES UNDER THE MODIFIED ALL-INCLUSIVE (MOD) AND CURRENT OPERATING PERFORMANCE (CUR) CONCEPTS

TABLE IX

COMPARISONS (WITH RESPECT TO ABSOLUTE AMOUNTS) OF FORECAST ERRORS ASSOCIATED WITH INCOME MEASURES UNDER THE MODIFIED ALL-INCLUSIVE (MOD) AND CURRENT OPERATING PERFORMANCE (CUR) CONCEPTS

Objective:	Same Series								All-inclusive							
Model:	Unweighted				Weighted				Unweighted				Weighted			
Period:	Concept resulting in lower absolute fore-cast error for major-ity of companies	Percentage of companies for which majority concept was lower	Concept resulting in lower absolute fore-cast error (as deter-mined by Wilcoxon test)	One tailed probability* of Wilcoxon T	Concept resulting in lower absolute fore-cast error for major-ity of companies	Percentage of companies for which majority concept was lower	Concept resulting in lower absolute fore-cast error (as deter-mined by Wilcoxon test)	One tailed probability* of Wilcoxon T	Concept resulting in lower absolute fore-cast error for major-ity of companies	Percentage of companies for which majority concept was lower	Concept resulting in lower absolute fore-cast error (as deter-mined by Wilcoxon test)	One tailed probability* of Wilcoxon T	Concept resulting in lower absolute fore-cast error for major-ity of companies	Percentage of companies for which majority concept was lower	Concept resulting in lower absolute fore-cast error (as deter-mined by Wilcoxon test)	One tailed probability* of Wilcoxon T
1952	MOD	55	MOD	.0740	MOD	56	MOD	.0852	CUR	55	CUR	.3543	CUR	52	CUR	.4867
1953	CUR	60	CUR	.0142	CUR	59	CUR	.0429	--	50	CUR	.2151	CUR	54	CUR	.3638
1954	MOD	56	MOD	.2121	MOD	51	MOD	.3038	CUR	52	CUR	.3347	CUR	54	CUR	.3814
1955	CUR	51	MOD	.4259	MOD	55	MOD	.2868	MOD	54	MOD	.0719	MOD	60	MOD	.0445
1952-55	--	50	MOD	.4329	MOD	51	MOD	.3170	CUR	51	CUR	.4486	CUR	50	MOD	.2763
1956	MOD	52	CUR	.4217	CUR	51	CUR	.2840	MOD	59	MOD	.3556	CUR	52	CUR	.2006
1957	CUR	53	CUR	.1040	MOD	52	CUR	.3564	CUR	53	CUR	.0122	CUR	56	CUR	.0531
1958	CUR	51	CUR	.2461	MOD	53	CUR	.4984	CUR	53	CUR	.1562	MOD	57	MOD	.3447
1959	MOD	51	MOD	.4921	CUR	57	CUR	.1165	MOD	51	CUR	.4933	CUR	52	CUR	.2709
1956-59	CUR	51	CUR	.1387	CUR	51	CUR	.1505	MOD	51	CUR	.0652	CUR	51	CUR	.0917
1960	CUR	68	CUR	.0090	CUR	62	CUR	.0333	CUR	57	CUR	.2870	CUR	56	CUR	.1985
1961	CUR	65	CUR	.0094	CUR	59	CUR	.0995	CUR	60	CUR	.0731	CUR	54	CUR	.3408
1962	CUR	55	CUR	.2966	CUR	56	CUR	.3233	CUR	58	CUR	.1945	CUR	57	CUR	.3778
1963	CUR	65	CUR	.0155	CUR	65	CUR	.0148	CUR	53	CUR	.4821	CUR	56	CUR	.1939
1960-63	CUR	63	CUR	.0001	CUR	60	CUR	.0017	CUR	57	CUR	.0623	CUR	55	CUR	.0939
1964	MOD	54	MOD	.4352	MOD	51	MOD	.3354	MOD	55	MOD	.3700	MOD	52	MOD	.3061
1965	--	50	CUR	.4538	CUR	55	CUR	.1648	MOD	61	MOD	.0651	MOD	58	MOD	.0955
1966	CUR	59	CUR	.0758	CUR	57	CUR	.0665	CUR	54	CUR	.3871	CUR	53	CUR	.2541
1967	CUR	53	MOD	.2021	--	50	MOD	.0711	CUR	57	CUR	.4203	CUR	52	MOD	.2740
1964-67	CUR	52	CUR	.4012	CUR	53	CUR	.4157	MOD	51	MOD	.2238	MOD	51	MOD	.1913
1952-67	CUR	54			CUR	53			CUR	51			CUR	51		

*These probabilities are based on different n values due to the dropping of all observations where the difference was zero.

TABLE X

COMPARISONS (WITH RESPECT TO ABSOLUTE AMOUNTS) OF FORECAST ERRORS ASSOCIATED WITH INCOME MEASURES UNDER THE ALL-INCLUSIVE (ALI) AND CURRENT OPERATING PERFORMANCE (CUR) CONCEPTS

TABLE X

COMPARISONS (WITH RESPECT TO ABSOLUTE AMOUNTS) OF FORECAST ERRORS ASSOCIATED WITH INCOME MEASURES UNDER THE ALL-INCLUSIVE (ALL) AND CURRENT OPERATING PERFORMANCE (CUR) CONCEPTS

Objective:	Same Series								All-inclusive							
Model:	Unweighted				Weighted				Unweighted				Weighted			
Period:	Concept resulting in lower absolute forecast error for majority of companies	Percentage of companies for which majority concept was lower	Concept resulting in lower absolute forecast error (as determined by Wilcoxon test)	One tailed probability* of Wilcoxon T	Concept resulting in lower absolute forecast error for majority of companies	Percentage of companies for which majority concept was lower	Concept resulting in lower absolute forecast error (as determined by Wilcoxon test)	One tailed probability* of Wilcoxon T	Concept resulting in lower absolute forecast error for majority of companies	Percentage of companies for which majority concept was lower	Concept resulting in lower absolute forecast error (as determined by Wilcoxon test)	One tailed probability* of Wilcoxon T	Concept resulting in lower absolute forecast error for majority of companies	Percentage of companies for which majority concept was lower	Concept resulting in lower absolute forecast error (as determined by Wilcoxon test)	One tailed probability* of Wilcoxon T
1952	ALL	51	ALL	.2449	CUR	52	ALL	.4602	CUR	56	CUR	.1862	CUR	61	CUR	.1035
1953	CUR	62	CUR	.0331	CUR	59	CUR	.0860	CUR	57	CUR	.2229	--	50	CUR	.4069
1954	ALL	52	ALL	.3287	ALL	51	CUR	.4831	CUR	52	CUR	.3535	CUR	52	CUR	.2644
1955	CUR	53	CUR	.3319	--	50	ALL	.4790	ALL	51	ALL	.1877	ALL	52	ALL	.1462
1952-55	CUR	53	CUR	.3039	CUR	53	CUR	.2613	CUR	52	CUR	.2593	CUR	53	CUR	.3249
1956	ALL	55	ALL	.4378	ALL	51	CUR	.4752	ALL	60	ALL	.3211	ALL	51	CUR	.3126
1957	CUR	61	CUR	.0371	ALL	51	CUR	.2037	CUR	63	CUR	.0004	CUR	59	CUR	.0094
1958	ALL	53	CUR	.4181	CUR	52	CUR	.4707	CUR	56	CUR	.0856	CUR	53	CUR	.2515
1959	CUR	52	ALL	.4241	CUR	58	CUR	.1987	ALL	52	ALL	.3422	ALL	51	ALL	.4933
1956-59	CUR	51	CUR	.1992	CUR	52	CUR	.2247	CUR	52	CUR	.0266	CUR	53	CUR	.3249
1960	CUR	69	CUR	.0018	CUR	64	CUR	.0071	CUR	55	CUR	.2240	CUR	55	CUR	.1122
1961	CUR	72	CUR	.0016	CUR	65	CUR	.0057	CUR	69	CUR	.0039	CUR	65	CUR	.0063
1962	CUR	61	CUR	.1036	CUR	60	CUR	.1258	CUR	62	CUR	.0494	CUR	59	CUR	.1672
1963	CUR	67	CUR	.0111	CUR	63	CUR	.0273	CUR	59	CUR	.1323	CUR	58	CUR	.2098
1960-63	CUR	68	CUR	.0000	CUR	63	CUR	.0000	CUR	61	CUR	.0005	CUR	59	CUR	.0021
1964	ALL	51	CUR	.4880	ALL	54	ALL	.3022	ALL	52	ALL	.4367	ALL	51	ALL	.4001
1965	CUR	51	CUR	.2557	CUR	63	CUR	.0176	ALL	60	ALL	.2418	ALL	52	ALL	.4710
1966	CUR	61	CUR	.0301	CUR	61	CUR	.0251	CUR	59	CUR	.0866	CUR	59	CUR	.0681
1967	CUR	52	ALL	.3350	--	50	ALL	.2154	CUR	56	CUR	.4308	CUR	51	ALL	.3464
1964-67	CUR	53	CUR	.1620	CUR	55	CUR	.1057	CUR	51	CUR	.4312	CUR	52	CUR	.3718
1952-67	CUR	56			CUR	55			CUR	54			CUR	54		

*These probabilities are based on different n values due to the dropping of all observations where the difference was zero.

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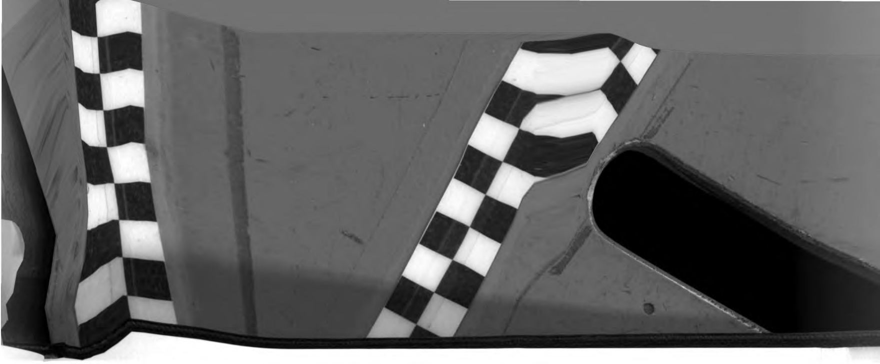

(4) In general the significance levels at which the null hypotheses could be rejected in favor of the current operating performance concept were higher for those comparisons between only two concepts than for those comparisons involving all three concepts. Frequencies regarding majorities and pluralities support this observation also.

(5) Based upon the data of Tables IX and X, it is the writer's opinion that the modified all-inclusive concept fared "better" against the current operating performance concept than did the all-inclusive concept.

(6) Based upon the data of Table X, it is the writer's opinion that the current operating performance concept fared "better" but not significantly better than did the modified all-inclusive concept. The difference as reflected by the Wilcoxon test was not great enough to allow rejection at the .05 level for any four year period, excepting 1960 through 1963, for any combination of forecast objective and prediction model.

4.3.2. <u>Procedures and findings relative to evaluating the significance of relative forecast amounts</u>

The purpose of comparing relative forecast amounts (i.e. the projected amount - <u>not</u> the resulting error) under each of the three concepts of income reporting, was to allow for evaluation of the relative conservatism of each of the three concepts. By definition, the concept that results in the least forecast is the most conservative.

Null hypothesis: When comparing the results of employing different income concepts to a company for a given time period, there is no difference in the expected number of least forecast measures associated with each of the income concepts, and any observed differences are merely chance variations to be expected in a random sample from the rectangular population where $f_1 = f_2 = f_3$. This is a more rigorous restatement of hypothesis C.2.

Alternative hypothesis: The frequencies f_1, f_2, and f_3 are not all equal.

Statistical test: Since this procedure involved comparing sample data with a presumed population, the goodness-of-fit type of statistical test is appropriate. The chi-square one sample test was chosen because the hypothesis under test concerned a comparison of observed and expected frequencies in discrete categories. The findings of this test are shown in Table XI.

Based upon an examination of Table XI it is the writer's opinion that there is an "overall significance" regarding the current operating performance concept of income reporting relative to the all-inclusive and modified all-inclusive concepts, with respect to associated forecast amounts. As shown in Table XI, in every case, it was the current operating performance concept which resulted in the most conservative forecasts. However, there is a possible

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Codes Use

Model:

Period:

1952
1953
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1952-55
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1956-59
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1962
1963
1960-63
1964
1965
1966
1967
1964-67

TABLE XI

CHI-SQUARE ONE-SAMPLE PROBABILITIES OF THE OBSERVED NUMBER OF COMPANIES FOR WHICH INCOME MEASURES UNDER EACH OF THREE INCOME CONCEPTS RESULTED IN THE LEAST FORECAST

Codes Used: ALL = All-inclusive concept
CUR = Current operating performance concept
MOD = Modified all-inclusive concept

Model:	Unweighted		Weighted	
Period:	Concept resulting in least forecast for plurality of companies	Probability	Concept resulting in least forecast for plurality of companies	Probability
1952	CUR	.0001	CUR	.0015
1953	CUR	.0000	CUR	.0015
1954	CUR	.0039	CUR	.0575
1955	CUR	.3536	CUR	.1426
1952-55	CUR	.0000	CUR	.0000
1956	CUR	.0015	CUR	.0074
1957	CUR	.0491	CUR	.1371
1958	CUR	.1040	CUR	.3679
1959	CUR	.3827	CUR	.5045
1956-59	CUR	.0000	CUR	.0010
1960	CUR	.1082	CUR	.1738
1961	CUR	.1738	CUR	.2638
1962	CUR	.1738	CUR	.5248
1963	CUR	.5045	CUR	.3827
1960-63	CUR	.0023	CUR	.0111
1964	CUR	.0344	CUR	.1606
1965	CUR	.0012	CUR	.0241
1966	CUR	.0241	CUR	.1738
1967	CUR	.1414	CUR	.1289
1964-67	CUR	.0000	CUR	.0000

explanation of this "overall significance" apart from a tendency of the current operating performance income measure to produce lesser forecasts than those generated with respect to either of the other two concepts. This "overall significance" could have been the result of relative extreme similarity between income measures under the all-inclusive and modified all-inclusive concepts. In order to eliminate this possible bias two additional sets of comparisons were made: one involving the current operating performance and modified all-inclusive concepts, and one involving the current operating performance and all-inclusive concepts. These procedures and findings are presented in the following two sub-sections.

4.3.2a <u>Procedures and findings relative to comparing the current operating performance and modified all-inclusive concepts</u>

Null hypothesis: When comparing the results of employing the current operating performance and modified all-inclusive concepts to a company for a time period, there is no difference in expected ratios between signed (positive or negative) forecasts (based on each of two concepts) and associated absolute all-inclusive income measures. Relative magnitude (of the ratios) as well as the direction of observed differences is considered, i.e. in terms of the Wilcoxon test, the sum of the positive ranks = the sum of the negative ranks.

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Alternative hypothesis: The sum of the positive ranks $\neq$ the sum of the negative ranks.

The Wilcoxon matched-pairs signed-ranks test was chosen because this hypothesis employs two related samples and involves two scores which can be ranked in order of absolute magnitude, i.e. the ratios possess measurement characteristics in the strength of an ordered metric scale. The findings of this test, along with certain descriptive data, are presented in Table XII.

4.3.2b <u>Procedures and findings relative to the current operating performance and all-inclusive concepts</u>

The null hypothesis, alternative hypothesis, statistical test, and presentation of findings exactly parallel those of sub-section 4.3.2a and consequently will not be repeated here. The findings, along with certain descriptive data, are presented in Table XIII.

4.3.2c <u>Observations concerning Tables XI, XII, and XIII</u>

The following observations are based on the data of Tables XI, XII, and XIII.

(1) The choice of prediction model apparently has no consistent effect as to which income concept yields the smaller forecast.

(2) Based upon the data of Tables XI, XII, and XIII, it is the writer's opinion that in general the current operating performance

TABLE XII

COMPARISONS (WITH RESPECT TO RELATIVE AMOUNTS) BETWEEN FORECASTS BASED UPON INCOME MEASURES UNDER THE MODIFIED ALL-INCLUSIVE (MOD) AND CURRENT OPERATING PERFORMANCE (CUR) CONCEPTS

Model:	Unweighted				Weighted			
Period:	Concept resulting in lower forecasts for majority of companies	Percent of companies for which majority concept was lower	Concept resulting in lower forecasts (as determined by Wilcoxon test)	Two tailed probability* of Wilcoxon T	Concept resulting in lower forecasts for majority of companies	Percent of companies for which majority concept was lower	Concept resulting in lower forecasts (as determined by Wilcoxon test)	Two tailed probability* of Wilcoxon T
1952	CUR	62	CUR	.0248	CUR	59	CUR	.1168
1953	CUR	66	CUR	.0250	CUR	62	CUR	.0188
1954	CUR	63	CUR	.0993	CUR	56	CUR	.1230
1955	CUR	54	CUR	.3016	CUR	55	CUR	.2276
1952-55	CUR	62	CUR	.0002	CUR	58	CUR	.0008
1956	CUR	67	CUR	.1399	CUR	63	CUR	.1670
1957	CUR	54	CUR	.2976	CUR	56	CUR	.1582
1958	CUR	52	MOD	.8984	MOD	52	MOD	.3918
1959	MOD	53	CUR	.9834	MOD	56	MOD	.8904
1956-59	CUR	55	CUR	.1948	CUR	53	CUR	.3094
1960	CUR	53	CUR	.2136	CUR	52	CUR	.1090
1961	CUR	52	CUR	.1378	MOD	52	CUR	.3248
1962	CUR	52	CUR	.3454	--	50	CUR	.7308
1963	MOD	57	MOD	.7314	MOD	53	CUR	.8612
1960-63	--	50	CUR	.1486	MOD	51	CUR	.1196
1964	CUR	58	CUR	.2942	CUR	56	CUR	.1462
1965	CUR	68	CUR	.0066	CUR	65	CUR	.0244
1966	CUR	59	CUR	.2468	CUR	57	CUR	.2384
1967	CUR	60	CUR	.6789	CUR	61	CUR	.7184
1964-67	CUR	61	CUR	.0062	CUR	60	CUR	.0100
1952-67	CUR	57			CUR	55		

*These probabilities are based on different n values due to the dropping of all observations where the difference was zero.

TABLE XIII

COMPARISONS (WITH RESPECT TO RELATIVE AMOUNTS) BETWEEN FORECASTS BASED UPON INCOME MEASURES UNDER THE ALL-INCLUSIVE (ALL) AND CURRENT OPERATING PERFORMANCE (CUR) CONCEPTS

TABLE XIII

COMPARISONS (WITH RESPECT TO RELATIVE AMOUNTS) BETWEEN FORECASTS BASED UPON INCOME MEASURES UNDER THE ALL-INCLUSIVE (ALL) AND CURRENT OPERATING PERFORMANCE (CUR) CONCEPTS

Model:	Unweighted				Weighted			
Period:	Concept resulting in lower forecasts for majority of companies	Percent of companies for which majority concept was lower	Concept resulting in lower forecasts (as determined by Wilcoxon test)	Two tailed probability* of Wilcoxon T	Concept resulting in lower forecasts for majority of companies	Percent of companies for which majority concept was lower	Concept resulting in lower forecasts (as determined by Wilcoxon test)	Two tailed probability* of Wilcoxon T
1952	CUR	68	CUR	.0018	CUR	65	CUR	.0050
1953	CUR	67	CUR	.0016	CUR	65	CUR	.0014
1954	CUR	62	CUR	.0170	CUR	54	CUR	.0696
1955	CUR	52	CUR	.6838	--	50	CUR	.5658
1952-55	CUR	62	CUR	.0000	CUR	59	CUR	.0000
1956	CUR	69	CUR	.0506	CUR	63	CUR	.1130
1957	CUR	55	CUR	.5606	CUR	56	CUR	.3808
1958	CUR	56	CUR	.7932	ALL	52	ALL	.7538
1959	CUR	52	CUR	.5448	ALL	51	CUR	.4764
1956-59	CUR	58	CUR	.1040	CUR	54	CUR	.1462
1960	CUR	55	CUR	.0630	CUR	53	CUR	.0520
1961	CUR	56	CUR	.0678	CUR	54	CUR	.0940
1962	CUR	55	CUR	.4128	ALL	51	CUR	.7858
1963	ALL	51	CUR	.5058	ALL	51	CUR	.4004
1960-63	CUR	54	CUR	.0100	CUR	51	CUR	.0174
1964	CUR	57	CUR	.3682	CUR	53	CUR	.4366
1965	CUR	64	CUR	.1510	CUR	58	CUR	.2826
1966	CUR	54	CUR	.4146	CUR	53	CUR	.4478
1967	CUR	52	CUR	.9592	CUR	56	CUR	.7096
1964-67	CUR	57	CUR	.0678	CUR	55	CUR	.1002
1952-67	CUR	58			CUR	55		

*These probabilities are based on different n values due to the dropping of all observations where the difference was zero.

concept resulted in significantly lesser forecasts than did either the modified all-inclusive or all-inclusive concepts. It should be observed that in all but two combinations of four year periods and forecast models the current operating performance concept resulted in a majority of lower forecasts with respect to both the modified all-inclusive concepts. There was no exceptions with regard to the Wilcoxon test. The average (mean) Wilcoxon probabilities were .1974 and .1138 respectively.

4.4 Procedures and findings relative to each of two income practices

This section is divided into two sub-sections. Sub-section 4.4.1 concerns hypotheses P.3 and P.4, i.e. it deals with comparisons relating to absolute amounts of forecast errors. Sub-section 4.4.2 concerns hypotheses P.5 and P.6, i.e. it deals with comparisons relating to signed amounts of forecasts.

4.4.1 Procedures and findings relative to evaluating the significance of absolute forecast errors

4.4.1a Test of hypothesis P.3

Null hypothesis: When comparing the results of employing different income practices to a company for a time period, there is no difference in the expected number of lesser absolute forecast error measures associated with each of the income practices, and any observed differences are merely chance variations.

Alternative hypothesis: The probability of a lesser absolute forecast error is greater with respect to the "as reported" practice.

Statistical test: Since this procedure involved comparing the results of two different treatments (i.e. income practices) to each company for a given time period, the two related sample type of statistical test is appropriate. The sign test was chosen because the hypothesis under test concerns only the relative size of absolute forecast errors. This test requires no assumptions regarding the distribution of differences, nor is it necessary to assume that the companies are similar in any way.

In order to acquaint the reader with the rationale and method of the sign test the following description is presented.[5]

The null hypothesis tested by the sign test is that

$$p(X_A > X_B) = p(X_A < X_B) = \frac{1}{2}$$

> where X_A is the judgment or score under one of the conditions (or after the treatment) and X_B is the judgment or score under the other condition (or before the treatment). That is, X_A and X_B are the two "scores" for a matched pair. Another way of stating H_o is: the median difference is zero.

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[5] *Ibid.*, p. 68.

> In applying the sign test, we focus on the direction of the differences between every X_{Ai} and X_{Bi}, noting whether the sign of the difference is plus or minus. Under H_o, we would expect the number of pairs which have $X_A > X_B$ to equal the number of pairs which have $X_A < X_B$. That is, if the null hypothesis were true we would expect about half of the differences to be negative and half to be positive. H_o is rejected if too few differences of one sign occur.
>
> . . . The probability associated with the occurrence of a particular number of +'s and -'s can be determined by reference to the binomial distribution. . . . If a matched pair shows no difference (i.e., the difference, being zero, has no sign) it is dropped from the analysis. . . .

The findings of this test, along with certain descriptive data, are presented in Table XIV.

4.4.1b <u>Test of hypothesis P.4</u>

Null hypothesis: When comparing the results of employing different income practices to a company for a time period, there is no difference in expected absolute forecast errors. Relative magnitude as well as the direction of observed differences is considered, i.e. in terms of the Wilcoxon test, the sum of the positive ranks (i.e. excesses of "as reported" forecast errors over modified all-inclusive forecast errors) = the sum of the negative ranks (i.e. excesses of modified all-inclusive forecast errors over "as reported" forecast errors).

TABLE XIV

COMPARISONS (WITH RESPECT TO ABSOLUTE AMOUNTS) OF FORECAST ERRORS ASSOCIATED WITH INCOME MEASURES UNDER THE AS REPORTED AND MODIFIED ALL-INCLUSIVE PRACTICES

Objective:	Same Series				All-inclusive			
Model:	Unweighted		Weighted		Unweighted		Weighted	
Period:	Percentage of companies for which as reported practice resulted in lesser forecast error	Binomial probability* of observed occurrence under null hypothesis	Percentage of companies for which as reported practice resulted in lesser forecast error	Binomial probability* of observed occurrence under null hypothesis	Percentage of companies for which as reported practice resulted in lesser forecast error	Binomial probability* of observed occurrence under null hypothesis	Percentage of companies for which as reported practice resulted in lesser forecast error	Binomial probability* of observed occurrence under null hypothesis
1952	39	.9573	37	.9778	55	.3258	48	.6742
1953	70	.0057	64	.0481	62	.0821	56	.2612
1954	56	.2757	57	.2257	53	.4373	51	.5000
1955	53	.3830	52	.4373	44	.8198	42	.8785
1952-55	54	.1517	52	.3260	53	.2209	49	.5943
1956	41	.9080	50	.5627	36	.9782	44	.7975
1957	49	.6170	46	.7336	53	.3804	49	.6254
1958	63	.0586	57	.2557	61	.1055	50	.5660
1959	61	.1279	63	.0877	63	.0877	62	.1077
1956-59	53	.2450	54	.2094	53	.2642	51	.4336
1960	65	.0494	68	.0235	50	.5766	60	.1808
1961	71	.0122	65	.0607	59	.1885	53	.4300
1962	58	.2366	60	.1808	50	.5747	59	.2210
1963	67	.0326	73	.0068	50	.5700	65	.0843
1960-63	65	.0002	66	.0001	52	.3267	59	.0311
1964	57	.2498	51	.5000	59	.1958	50	.5679
1965	61	.1279	67	.0401	46	.7502	45	.7709
1966	62	.0998	64	.0662	50	.5679	55	.3601
1967	65	.0498	59	.1620	65	.0607	59	.1958
1964-67	61	.0044	60	.0092	55	.1526	52	.3293
1952-67	58		58		53		53	

*These probabilities are based on different n values due to the dropping of all observations where the difference was zero.

Alternative hypothesis: The sum of the negative ranks > the sum of the positive ranks.

The findings of this test are presented in Table XV.

4.4.1c Observations concerning Tables XIV and XV

(1) The choice of prediction model apparently has no consistent effect as to which income reporting practice yields the lesser absolute forecast error.

(2) For the earlier years of the test period, the choice of forecast objective had no consistent effect as to which income reporting practice resulted in the lesser absolute forecast error. However, for the latter years, the "as reported" practice resulted in significantly better forecasts under the same series forecast objective than did the modified all-inclusive practice. For such combinations of four-year periods and prediction models, both the sign and Wilcoxon tests rejected the respective null hypotheses at the .01 level.

(3) Based upon the data of Tables XIV and XV, it is the writer's opinion that in general the "as reported" practice resulted in "better" but not significantly better forecasts than did the modified all-inclusive practice.

4.4.2 Procedures and findings relative to evaluating the significance of relative forecast amounts

4.4.2a Test of hypothesis P.5

Null hypothesis: When comparing the results of employing different income practices to a company for a time period, there is no difference in the expected number of lesser forecasts associated with each of the income practices,

TABLE XV

WILCOXON MATCHED-PAIRS SIGNED-RANKS TEST WITH RESPECT TO LESSER ABSOLUTE FORECAST ERROR OF AS REPORTED (REP) AND MODIFIED ALL-INCLUSIVE (MOD) INCOME PRACTICES

Objective:	Same Series				All-inclusive			
Model	Unweighted		Weighted		Unweighted		Weighted	
Period:	Practice which resulted in lesser forecast errors (per rank sums)	One tail probability* of observed (or greater) Wilcoxon T	Practice which resulted in lesser forecast errors (per rank sums)	One tail probability* of observed (or greater) Wilcoxon T	Practice which resulted in lesser forecast errors (per rank sums)	One tail probability* of observed (or greater) Wilcoxon T	Practice which resulted in lesser forecast errors (per rank sums)	One tail probability* of observed (or greater) Wilcoxon T
1952	MOD	.1096	MOD	.0509	REP	.2044	REP	.4953
1953	REP	.0087	REP	.0371	MOD	.0855	REP	.3028
1954	REP	.0834	REP	.2154	MOD	.1986	MOD	.4445
1955	REP	.3018	REP	.4201	MOD	.1426	MOD	.1102
1952-55	REP	.0732	REP	.3056	MOD	.1615	MOD	.3561
1956	REP	.4652	REP	.1632	MOD	.1758	MOD	.4875
1957	REP	.3485	REP	.3274	REP	.0961	REP	.1178
1958	REP	.0111	REP	.0707	REP	.0171	REP	.2497
1959	REP	.2104	REP	.0978	REP	.1972	REP	.1847
1956-59	REP	.0343	REP	.0189	REP	.0469	REP	.0918
1960	REP	.0130	REP	.0177	REP	.3896	REP	.0993
1961	REP	.0103	REP	.0651	REP	.2000	REP	.4332
1962	REP	.0946	REP	.0993	REP	.3163	REP	.2070
1963	REP	.0100	REP	.0023	MOD	.3201	REP	.1402
1960-63	REP	.0000	REP	.0001	REP	.2641	REP	.0442
1964	REP	.1972	REP	.4479	REP	.2497	MOD	.4154
1965	REP	.1144	REP	.0222	MOD	.2356	MOD	.2087
1966	REP	.0470	REP	.0118	MOD	.4558	REP	.1889
1967	REP	.0228	REP	.1847	REP	.0350	REP	.1847
1964-67	REP	.0037	REP	.0050	REP	.2558	REP	.3417

*These probabilities are based on different n values due to the dropping of all observations where the difference was zero.

and any observed differences are merely chance variations.

Alternative hypothesis: The probabilities of obtaining lesser forecasts are not equal with respect to the two practices.

Statistical test: Since this procedure involved comparing the results of two different treatments (i.e. income practices) to each company for a given time period, the two related sample type of statistical test is appropriate. The sign test was chosen because the hypothesis under test concerns only the relative size of forecasts. Findings of this test, along with certain descriptive data, are presented in Table XVI.

4.4.2b Test of hypothesis P.6

Null hypothesis: When comparing the results of employing the "as reported" and modified all-inclusive practices to a company for a time period, there is no difference in expected ratios between signed (positive or negative) forecasts (based on each of two practices) and associated absolute all-inclusive income measures. Relative magnitude (of the ratios) as well as the direction of observed differences is considered, i.e. in terms of the Wilcoxon test, the sum of positive ranks = the sum of the negative ranks.

Model:

Period:
1952
1953
1954
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TABLE XVI

COMPARISONS OF FORECASTS ASSOCIATED WITH INCOME MEASURES UNDER THE AS REPORTED AND MODIFIED ALL-INCLUSIVE PRACTICES

Model:	Unweighted		Weighted	
Period:	Percentage of companies for which "as reported" practice resulted in lesser forecast	Lesser binomial probability* of observed occurrence under null hypothesis	Percentage of companies for which "as reported" practice resulted in lesser forecast	Lesser binomial probability* of observed occurrence under null hypothesis
1952	55	.3258	53	.4402
1953	48	.4388	54	.3746
1954	55	.3179	51	.5000
1955	49	.5000	50	.5660
1952-55	51	.3792	52	.3454
1956	55	.3220	56	.3089
1957	63	.0631	62	.0998
1958	66	.0298	53	.4340
1959	37	.0877	38	.1077
1956-59	56	.0780	52	.3079
1960	44	.2983	40	.1808
1961	38	.1077	34	.0551
1962	46	.4253	48	.5000
1963	38	.1077	35	.0843
1960-63	41	.0297	39	.0126
1964	47	.4321	53	.4321
1965	69	.0205	69	.0307
1966	65	.0607	71	.0147
1967	65	.0607	65	.0607
1964-67	61	.0052	64	.0010
1952-67	53		52	

*These probabilities are based on different n values due to the dropping of all observations where the difference was zero.

Alternative hypothesis: The sum of the positive ranks $\neq$ the sum of the negative ranks.

The Wilcoxon matched-pairs signed-ranks test was chosen because this hypothesis employs two related samples and involves two scores which can be ranked in order of absolute magnitude, i.e. the ratios possess measurement characteristics in the strength of an ordered metric scale. The findings of this test, along with certain descriptive data, are presented in Table XVII.

4.4.2c <u>Observations concerning Tables XVI and XVII</u>

(1) The choice of prediction model apparently has no consistent effect as to which income practice yields the lesser forecast.

(2) Based upon the data of Tables XVI and XVII, it is the writer's opinion that in general there was no significant consistent difference with respect to forecast amounts under each of the two practices.

WI
B

Model:

Period:

1952
1953
1954
1955
1952-55
1956
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1958
1959
1956-59
1960
1961
1962
1963
1960-6
1964
1965
1966
1967
1964-6

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TABLE XVII

WILCOXON MATCHED-PAIRS SIGNED-RANKS TEST ON FORECASTS BASED UPON INCOME MEASURES UNDER AS REPORTED (REP) AND MODIFIED ALL-INCLUSIVE (MOD) PRACTICES

Model:	Unweighted		Weighted	
Period:	Concept resulting in lesser forecasts	Two tailed probability* of Wilcoxon T	Concept resulting in lesser forecasts	Two tailed probability* of Wilcoxon T
1952	REP	.6067	REP	.9070
1953	REP	.9054	REP	.6452
1954	REP	.8088	MOD	.8670
1955	MOD	.7444	MOD	.9124
1952-55	REP	.6826	REP	.7200
1956	MOD	.9352	MOD	.9624
1957	REP	.1064	REP	.0810
1958	REP	.1928	REP	.5716
1959	MOD	.6116	MOD	.6268
1956-59	REP	.1976	REP	.2778
1960	REP	.8224	REP	.9754
1961	MOD	.9256	MOD	.6536
1962	MOD	.8554	MOD	.7732
1963	MOD	.1970	MOD	.2584
1960-63	MOD	.5176	MOD	.4256
1964	REP	.8576	REP	.3514
1965	REP	.0360	REP	.0390
1966	REP	.0956	REP	.0812
1967	REP	.1558	REP	.3090
1964-67	REP	.0112	REP	.0064

*These probabilities are based on different n values due to the dropping of all observations where the difference was zero.

CHAPTER V

SUMMARY AND CONCLUSIONS

5.1 Overview

The primary purpose of this chapter is to present the conclusions reached as a result of this study and to briefly examine their implications for accounting practice. The chapter begins with a brief summary of the purpose of the research and research design. The next section reviews the various hypotheses and findings. This section also includes the general conclusions and implications for accounting practice. The final section suggests some directions for future research.

5.2 Brief summary of purpose and research design

The problem addressed in this study concerns the method of reporting extraordinary items and prior period adjustments in annual financial reports of business corporations. The criterion of predictive assistance was selected as a means of providing a possible solution to the diversity of views surrounding this area of financial reporting. Finally, historical empirical evidence was examined with respect

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respect to the predictive assistance criterion in comparing several income reporting alternatives. Comparisons were made on both a conceptual level, i.e. between concepts, and on a pragmatic level, i.e. between practices.

The basic technique of this study was to examine each of several income reporting alternatives with respect to resulting forecasts where earnings per share figures based on each reporting alternative were used as inputs to two different prediction models. The resulting forecasts were then compared to each of two different actual values with the dollar difference between the forecast value and actual value being expressed as a percentage of the actual. These ratios constitute the forecast error measures that were compared to determine which of the associated reporting alternatives would have been (for the test period) of greater aid in forecasting earnings potential.

5.3 Findings, conclusions, and implications

As was pointed out in Chapter II, the findings of any predictive study depend in part upon the particular model(s) employed. However, from the various findings of this study, it would appear that in general there was a greater effect upon both forecast magnitude and associated error resulting from the choice of historical time periods than from the choice of ei

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choice of either prediction model, forecast objective, or income reporting alternative.

Hypothesis C.1 was concerned with whether, among the three income concepts, there was any consistent significant difference as to which income measure resulted in better forecasts. The alternative hypothesis was that the current operating performance concept would generate better forecasts than either of the other two concepts. The results of the formal testing of Hypothesis C.1 are presented in Tables VIII, IX, and X.

After examining the findings reported in the above named tables, it is the writer's conclusion that for the test period as a whole there was a slight tendency for the current operating performance concept to generate better forecasts than either of the other two concepts. However, in view of divergency of results between various sub-periods within the total period covered by the study, it is the writer's opinion that this observed overall tendency favoring the current operating performance concept was so slight as to render it totally insignificant with respect to the establishment of theoretical ideals which might serve as guidelines for future accounting practice. Thus for Hypothesis C.1, H_o was not rejected.

Even though comparisons between concepts showed no significant differences, in order to evaluate the modified all-inclusive alternative (per APB Opinion No. 9) on a practical basis it was still necessary to compare the two practices for two reasons: (a) possible biases inherent to this study's method of operationalizing the various concepts and (b) the possibility that past (pre APB Opinion No. 9) practice was better (i.e. resulted in greater predictability) than any consistently applied recognized theoretical concept. Hypotheses P.3 and P.4 were concerned with whether, between the two practices, there was any consistent significant difference as to which income measure resulted in better forecasts. The alternative hypotheses were that the "as reported" practice would generate better forecasts. The results of the formal testing are presented in Tables XIV and XV.

Examination of the findings shown in Tables XIV and XV led the writer to the conclusion that in general the "as reported" practice resulted in "better" (in 15 out of 16 cases per Table XIV and in 14 out of 16 cases per Table XV), but not significantly better (significant at .01 for only 2 of the 15 cases per Table XIV and for only 4 of the 12 cases per Table XV), forecasts than did the modified all-inclusive practice. Thus for Hypotheses P.4 and P.5, H_O was again not rejected.

As was pointed out in Chapter II, arguments for both the current operating performance concept (as a theoretical ideal) and the "as reported" practice (as a realized resultant of this ideal) are based solely on the generation of data more useful in making future predictions. Given the research design of this study, historical empirical evidence failed to substantiate this argument. Thus the writer considers this study to be empirical support for the position advanced in Accounting Principles Board Opinion No. 9 with respect to the single amount to be designated as net income for the period.

In addition to comparing the various concepts and practices with respect to goodness of forecasts (i.e. magnitude of absolute forecast error), they were also examined from the secondary viewpoint of conservatism, i.e. as to which alternative, if any, tended to consistently result in lesser forecasts. Hypothesis C.2 was concerned with whether, among the three income concepts, there was any significant difference as to which measure resulted in lesser forecasts. The results of the formal testing of Hypothesis C.2 are presented in Tables XI, XII, and XIII. Hypotheses P.5 and P.6 involved comparisons between the two practices. The results of testing Hypotheses P.5 and P.6 are presented in Tables XVI and XVII.

Examination of the findings led the writer to the following conclusions. In general, the current operating

performance concept resulted in significantly lesser forecasts than did either of the other two concepts. However, there was no significant consistent difference with respect to forecast amounts under each of the two practices. This suggests the notion that in practice management varies its interpretation of accounts and/or method of accounting in such a way as to maximize the firm's apparent earnings potential. Accordingly a comparison was made between the current operating performance concept and the "as reported" practice. The findings (see Table XVIII) are consistent with this notion since under the Wilcoxon test the current operating performance income measure resulted in lower forecasts for all cases with average probabilities of .0923 and .1565 relative to the unweighted and weighted prediction models respectively. A similar comparison was also made with respect to goodness of forecasts. However, the findings showed no significant differences and are not reported herein.

5.4 Suggestions for future research

This study concerned the designation of a single figure as net income for the period. In this respect its findings support the modified all-inclusive approach as set forth in APB Opinion No. 9. However, as pointed out in Chapter I this opinion also requires the amount shown as net

TABLE XVIII

COMPARISONS OF FORECASTS ASSOCIATED WITH INCOME MEASURES UNDER THE CURRENT OPERATING PERFORMANCE CONCEPT AND THE AS REPORTED PRACTICE

	Alternative resulting in lower forecast for majority of companies	Percentage of companies for which majority alternative was lower	Alternative resulting in lower forecasts per Wilcoxon test	One tailed probability* of Wilcoxon T
Model: Unweighted				
1952-55	CUR	60	CUR	.0001
1956-59	CUR	51	CUR	.3299
1960-63	CUR	60	CUR	.0001
1964-67	CUR	55	CUR	.0429
1952-67	CUR	57		
Model: Weighted				
1952-55	CUR	55	CUR	.0006
1956-59	REP	50	CUR	.4679
1960-63	CUR	57	CUR	.0012
1964-67	REP	51	CUR	.1564
1952-67	CUR	53		

*These probabilities are based on different n values due to the dropping of all observations where the difference was zero.

income before extraordinary items to include certain amounts that heretofore were considered to be extraordinary. It is the writer's suggestion that the Board's new standards for ascertaining net income before extraordinary items be subjected to the test of empirical verification.

The subject of this study has been the source of many controversies among and between those people engaged in preparing financial statements and those using said statements. Even though the very existence of this controversy was accepted as justification for this study, the writer recognizes that whether or not there is a "real" problem at all rests upon the truth of the assumption of functional fixation, i.e. the notion that many users do focus upon the single amount designated as net income for the period and do not adequately use the financial statements as a whole. It is the writer's suggestion that much additional research be done in this behavioral aspect of accounting. If alternative methods of presentation are found not to affect certain decisions, then the entire discussion over which alternative is desirable is irrelevant with respect to those decisions. Such behavioral studies could take the form of questionnaire surveys, laboratory simulations, and real world observations. The latter form of study would be involved in addressing the question raised in Chapter II: to what extent, if any, is a firm's

market price affected by alternative methods of income reporting? "The greatest accounting need both at the present and in the future is the determination of the nature of information needs of users of accounting communication."[1]

[1]American Accounting Association, Committee to Prepare a Statement of Basic Accounting Theory, *A Statement of Basic Accounting Theory*, p. 69.

APPENDIX A

APPENDIX A

Companies Included In The Study

1. Allied Chemical Corporation (formerly Allied Chemical & Dye Corp.)
2. American Consumer Industries, Inc. (formerly American Ice Co.)
3. The American News Company
4. American Seating Company
5. American Smelting & Refining Company
6. Bayuk Cigars Incorporated
7. Beech Aircraft Corporation
8. The Bendix Corporation (formerly Bendix Aviation Corp.)
9. Bethlehem Steel Corporation
10. Briggs & Stratton Corporation
11. Brunswick Corporation (formerly Brunswick-Balke-Collender Co.)
12. Caterpillar Tractor Co.
13. Celanese Corporation
14. Central Aquirre Sugar Company
15. Chris-Craft Industries, Inc. (formerly NAFI Corp., National Automotive Fibres, Inc.)
16. Cincinnati Milling Machine Co.
17. City Stores Company
18. Columbia Pictures Corporation
19. Congoleum-Nairn Inc.
20. Continental Baking Company
21. Continental Steel Corporation
22. Corning Glass Works
23. Culter-Hammer, Inc.
24. DeSoto, Inc. (formerly DeSoto Chemical & Coating, Inc., United Wall Paper, Inc.)
25. Detroit Steel Corporation
26. Diamond International Corporation (formerly Diamond National Corp., Diamond Gardner Corp., Diamond Match Co.)
27. The Dow Chemical Company
28. The Duplan Corporation
29. E. I. du Pont de Nemours & Co.
30. ESB Incorporated (formerly Electric Storage Battery Co.)
31. Eastern Stainless Steel Corporation
32. Eastman Kodak Company
33. Evans Products Company

34. Federated Department Stores
35. General American Transportation Corporation
36. General Cigar Company, Inc.
37. General Electric Company
38. General Foods Corporation
39. Getty Oil Company (formerly Pacific West Oil Corp.)
40. Gould-National Batteries, Inc. (formerly National Battery Co.)
41. The Great Western Sugar Co.
42. Gulf Oil Corp.
43. Hotel Corporation of America (formerly Childs Company)
44. Hudson Bay Mining and Smelting Co., Ltd.
45. Interco Incorporated (formerly International Shoe Co.)
46. Joy Manufacturing Company
47. Keebler Company (formerly United Biscuit Co. of America)
48. Kimberly Clark Corporation
49. Magnavox Company
50. The Manhattan Shirt Co.
51. The Maytag Company
52. McGraw-Hill, Inc.
53. McQuay-Norris Manufacturing Company
54. Mercantile Stores Company, Inc.
55. Metro-Goldwyn-Mayer, Inc. (formerly Loew's Inc.)
56. Midland-Ross Corporation (formerly Midland Steel Products Co.)
57. Minnesota Mining & Manufacturing Company
58. Mission Corporation
59. Munsingwear, Inc.
60. G. C. Murphy Company
61. NVF Company (formerly National Vulcanized Fibre Co.)
62. National Can Corporation
63. National Service Industries, Inc. (formerly National Linen Service Corp.)
64. National Steel Corporation
65. Royal Crown Cola Co. (formerly Nehi Corp.)
66. St. Joseph Lead Co.
67. Sheraton Corporation of America
68. Simmons Company
69. Sinclair Oil Corporation
70. The L. S. Starrett Company
71. Sun Chemical Corp.
72. Sun Oil Company
73. United States Tobacco Co.
74. F. W. Woolworth Co.
75. Westinghouse Electric Corp.
76. The Youngstown Steel Door Co.

APPENDIX B

APPENDIX B

Form used to collect data on each extraordinary income determinant, prior period adjustment-new, or prior period adjustment-old.

Company____ Number________________

Year ending_______________

Number of items___________

* *

Charge______

Credit______

Amount before tax______,_______,______.

Amount after tax ______,_______,______.

$ effect on EPS______________________

Adjustment Factor____________________

$ effect on Adj EPS__________________

% effect on Adj EPS__________________

Tax effect: Reported______, Estimated______

PRESENTATION IN REPORT

BEFORE net income:

Among ordinary items________

Separate section____________

Notes, letter, etc.__________

AFTER net income:

On income statement_________

Combined statement__________

R E statement_______________

Caption item reported under_______________________________________

Item title____

Item description____

____

____

____

____

APPENDIX C

APPENDIX C

Form used to collect data and make computations by company, by year.

Company________________________________ Number__________________

Year ending______________________________ Number of items__________

(A) Net income before federal income tax (B+D) . . . . $_______,______,______.

(B) Federal income tax expense. . . . . $_______,______,______.

(C) Average tax rate (B÷A) . . . . _______.__________

(D) Net income as reported. . . . . $_______,______,______.

(E) Total preferred dividends . . . . $_______,______,______.

(F) Earnings to common stockholders (D-E) . . . . $_______,______,______.

(G) EPS as reported . . . . $________________

(H) Average number of common shares o/s (F÷G) . . ________________

(I) Common shares o/s at year end . . . . ________________

(J) Adjustment Factor . . . . ________________

(K) Adjusted reported EPS (GxJ) . . . . $________________

(L) Items included in (K) above: Credit (Charge)

No____ $______ No____ $______ No____ $______

No____ $______ No____ $______ No____ $______ $________________

(M) Current operating income (K-L) . . . . $________________

(N) All items except PPA_{new}: Credit (Charge)

No____ $______ No____ $______ No____ $______

No____ $______ No____ $______ No____ $______ $________________

(O) Modified all-inclusive income (M+N)

(P) PPA_{new}: No____ $______ No____ $______ $________________

(Q) All-Inclusive income (O+P) . . . . $________________

APPENDIX D

APPENDIX D

Form used to summarize, by company, certain information contained on form shown as Appendix C.

Company____ Number______________

	EPS under the following income concept:			
Year	As Reported	Current Operating	Modified All-inclusive	All-Inclusive
1947				
1948				
1949				
1950				
1951				
1952				
1953				
1954				
1955				
1956				
1957				
1958				
1959				
1960				
1961				
1962				
1963				
1964				
1965				
1966				
1967				

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