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A Dissertation

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in

The Department of Accounting

by

A.K. Zawati
B.S., Damascus University, 1964
M.S., Syracuse University, 1971
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ABSTRACT

In recent years, accountants have become increasingly concerned with which controversial concept of asset valuation to adopt in preparing financial statements. Asset valuation concepts seem to be a fundamental issue in income determination. Of these concepts, current value has been widely recommended as a means of improving financial information so as to make it more useful in making predictions and decisions. One major criticism of current value accounting is that it might be subjective and personal bias could be introduced. This is true especially when there are no well-defined market prices, as with industrial and commercial real estate.

At present, conclusive empirical evidence relevant to this controversy seems not to exist. Therefore, the purpose of this study is to empirically test the reliability and predictability of appraisal techniques as a means of estimating current value as compared with historical value. In the study, current value accounting is evaluated on the grounds of not only its usefulness, but also its predictability and objectivity. Perception of current value as an essential part of communication is also considered.
A random sample of 250 large corporations in the U.S. was selected and top financial executives were asked to provide (1) their views on the reliability of appraisal values when used as an estimate of current value (Part I of the questionnaire), and (2) data regarding selling, independent appraisal, and book values (Part II). The usable response to Part I was 23 percent. Part II contains information concerning 142 commercial and industrial real estate properties.

The results of the executives' perceptions revealed strong support of appraisal value as being a reliable estimate of current value. A study of the characteristics of the sample and a test of the hypotheses revealed that appraisal value is more reliable and objective than book value and that there is no difference between appraisal and selling values at the .05 level of significance. A similar finding supported no difference between book values and selling values, even though a level of significance was approached. Appraisers, furthermore, did not seem to be affected by regional differences or assessed factors affecting changes in economic conditions.

Regression models of appraisals were compared and evaluated with those of book values. As a result, simple prediction (regression) models that used current values
had more predictive ability than those which used book values. Multiple regression (prediction) models which used both current and book values were superior to simple prediction models.

The use of appraisals as a method of estimating current value is an area which has been relatively forgotten by accountants. This study is an invitation and a challenge to accountants to conduct more research in this area.
CHAPTER I

BACKGROUND

Objectives of Financial Statements

There is controversy in accounting concerning which concept of asset valuation to adopt for financial reporting. A possible solution to this controversy could result from the establishment of financial reporting objectives.

The prerequisite starting point in any field of study is the determination of the objectives and functions of the field. Clear and definitive objectives lead to a better understanding of controversies and aid in finding solutions to controversial issues. This study attempts to clarify the aspects of financial statement objectives.

The Committee to Prepare a Statement of Basic Accounting Theory (ASOBAT) of the American Accounting Association (AAA) described accounting as "the process of identifying, measuring, and communicating economic information to permit informed judgements and decisions by users of the information."¹ This definition attempts to

identify and determine information needed for users' decisions regarding the firm. Emphasis is placed on broad concepts of measuring and communicating information needed in the decision-making process. The Committee has not restricted accounting only to conventional measurements, but has left room for the admission of other non-conventional measurements that might be found desirable in the future.

In Statement No. 4, the Accounting Principles Board (APB) stated that the general objective of financial statements "is to provide reliable financial information." Similarly, Arthur Young & Company stated that "the primary objective of financial statements should be to communicate reliable financial information." In addition, the Trueblood Committee mentioned that information must be useful toward making predictions. This position was emphasized in most of the objectives the Committee set forth for financial statements.

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4 Ibid., pp. 29-38.
The ultimate aim of financial reporting is to communicate and measure reliable financial information. The information should be useful for making predictions and economic decisions.

There are two approaches in viewing users. The first is based on the assumption that financial data are prepared for interpretation by different groups of unknown users. The objective of financial reporting is to emphasize the provision of relevant information which helps a variety of users in making decisions. This objective is found in the 1957 statement of the AAA in which it is maintained that "the primary function of accounting is to accumulate and communicate information essential to an understanding of the activities of an enterprise." The interested groups could include investors, financial analysts, creditors, employees, customers, governmental agencies, etc. and could possibly be extended to include the public in general.

In contrast, the second approach is based on the assumption that the financial reporting objective is to provide information which is relevant to a specific user-group. The previous assumption of providing relevant

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data to a variety of unknown users has recently been challenged on the ground that more attention is needed concerning the nature of information and its value to particular user-groups of financial reporting. Consequently, a different view toward the respective identities of these users and their separate needs is required.

There is a need for more research to determine what information is needed for each specific user-group. Until such research is accomplished, financial statements should attempt to satisfy as many expected user-groups as possible. Therefore, a criterion for selecting financial information is essential. One criterion that appears to be reasonably applicable is the usefulness of such information. Snavely recognized it as the first-level criterion when he stated, "the criterion of usefulness occupies the highest level of the criteria hierarchy, being the only one that is not restricted in its applicability."  

If the usefulness criterion is accepted, relevant characteristics or concepts for this criterion should be specified. This is crucial if the objectives of financial statements are to be useful in decision making.

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A concept of relevance is necessary. Financial information should be relevant in order to fulfill its objectives. Relevance was described by the AAA as:

the primary standard and requires that the information must bear upon or be usefully associated with actions it is designed to facilitate or results desired to be produced.⁷

Accounting currently deals with volumes of financial data. Accountants should be careful to select financial data that are relevant to the various user-groups. Materiality in accounting, which is very similar to the concept of relevance in many respects, is crucial to users.⁸ Too much information could be just as critical as too little information. The 1957 statement of the AAA pointed out that "an item should be regarded as material if there is reason to believe that knowledge of it would influence the decisions of an informed investor."⁹ Therefore, materiality could be a guide to the concept of relevance.

The reliability concept recognizes that "for information to be useful, a user must be able to depend

⁷Committee on Accounting Concepts and Standards, op. cit., p. 7.


⁹Committee on Accounting Concepts and Standards, op. cit., p. 8.
Reliability measures how close data are to what they are supposed to be. Therefore, reliability and objectivity are closely related.

In making financial decisions, comparability facilitates prediction making by creditors, investors, and others. Comparability is the quality of having enough similar characteristics to make an appropriate comparison. It is important to distinguish between the comparability concept and the uniformity concept. The latter implies that the presentation of financial reports by different firms requires the same accounting presentation. Hendriksen points out this distinction:

That is, the goal of uniformity frequently implies the presentation of financial statements by different firms using the same accounting procedures, measurement concepts, classifications and methods of disclosure, as well as a similar basic format in the statements. As used in the context, the concept is rightfully criticized. The objective should be comparability, not strict uniformity.\(^\text{11}\)

One could agree with Hendriksen that the objective of comparability is more important than strict uniformity for two reasons.

\(^{10}\)Snavely, \textit{op. cit.}, p. 228

(1) Life and business environments change continually. It is realistic to allow room for this change by not restricting firms to a narrow uniformity.

(2) Generally, accounting principles have not achieved uniformity. Perhaps this is because it is extremely difficult to find unified principles to apply to all firms.

Consistency, which means the use of the same accounting principles and procedures from period to period by the accounting entity, is also necessary.\textsuperscript{12} This concept strengthens comparability and results in information that is more useful to decision makers.

Financial reports are the end result and primary objective of financial reporting. As such, they provide reliable information which is useful either in making economic decisions or in predicting future events by those who depend primarily on these reports. In addition, effective communication would affect those decisions and predictions.

\textbf{Use of Different Valuation Bases to Achieve Objectives}

The income figure is one of the most important single items reported in financial statements. For this

\textsuperscript{12}Ibid., p. 108.
reason, it is perhaps the most helpful tool in achieving the objectives of financial statements.

Income is of major significance in two ways. First, income is important because it is the most used single figure reported in accounting statements. . . . The second, and probably most important, way in which income is significant is as a conceptual framework within which the accounting system operates.\(^1\)

Although income is an important measurement, different bases of asset valuation would lead to different income figures. Therefore, the asset valuation theory is crucial in defining income. In other words, asset valuation has been subordinated to income determination.\(^1\)

There are many alternative models and concepts of asset valuation. Supporters of each alternative claim it fulfills the objectives of financial statements because it presents useful information to users.

**The Conventional or Historical Value**

The conventional or historical value concept has been the most common valuation method and has dominated


\(^{14}\)Hendriksen, *op. cit.*, p. 255.

accounting valuation. The American Institute of Certified Public Accountants (AICPA) has emphasized the historical concept, as evidenced in its 1936 statement:

The functions of accounting are
1. Making a historical record properly classified, of all the transactions of a business enterprise; . . . 3. From these historical records, calculations, and estimates, preparing from time to time statements showing all the more important aspects of the capital and income of the business and the legal equities in them, satisfying thereby the need for information of all the parties in interest.¹⁶

The official announcements of the AICPA have repeatedly stressed this concept. An exception occurs when the market value decreases below historical costs in valuation of certain assets such as inventories. Supporters of historical value defend this concept because (1) it serves conservatism—essential to accountants; (2) it is objective and provides a measure of protection; (3) it is less costly than other methods; and (4) it is useful in making decisions.¹⁷ Mautz stated:

If those who make management and investment decisions had not found financial reports based on historical cost useful over years, change in accounting would long since have been made.¹⁸

¹⁸Ibid.
The AAA has changed its position slightly. It had placed emphasis on the historical concept in its statements before 1957\(^{19}\) and 1966.\(^{20}\) The 1948 statement points out the usefulness of such a concept.

The most commonly useful financial statements report the origin and disposition of the assets of an enterprise in terms of costs established and recorded at the time the assets are acquired.\(^{21}\)

It is true that historical value has its objectivity and verifiability at the point of exchange. However, these qualities may not exist over time because of the instability of prices. The world is continually changing, yet historical value does not show this phenomenon. Effective reporting can take place only if the report reflects the reality of the firm's financial position— the main concern of users of financial reports. Perhaps this is why Knortz has said that historic value is a prime cause of confusion among accountants.\(^{22}\) He states:


Conventional reporting today fails miserably to meet the needs of an informed business community because of its compliant attitude toward two great evils of financial reporting: (1) reliance on historic cost and (2) the principle of realized earnings. These evils, more than any other factors of accounting practices, have caused legislatures, courts, and the public to be suspicious of financial reports of reputable companies certified by reputable public practitioners.\(^2\)

The historic concept as a basis for the valuation theory has been criticized as being misleading. This is primarily because the concept makes no assessment of general or relative changes in prices.

**Price-Level, Current Value, and the Crossroads**

In the last two decades, there has been a tendency to repeatedly stress opposition to historical value. Accountants now seem to be approaching a crossroads.

Some have placed emphasis on the measurement unit.\(^2\) Money value, as a unit of measurement, has been changing. Inflation has become almost worldwide.

\(^2\)Ibid., p. 18.

Therefore, financial statements have to be presented in common dollar units if they are to reflect changes in the purchasing power of currencies. This can be accomplished by applying a general price-level index.

Statement No. 3, issued in 1969 by the APB, stated that general price-level financial statements or pertinent information extracted therefrom present useful information not available from basic historical dollar financial statements. According to official sources, a great deal of evidence received by the Sandilands Committee has tended to argue very persuasively in support of either replacement costs or current purchasing power. However, in most European countries, accounting was adjusted by the application of a general price coefficient, often followed by revaluation of the nation's currency.

The AAA reports (August 1974 and September 1975) to the Financial Accounting Standards Board (FASB) from the Price-Level Reporting Subcommittee on Financial Reporting by Segments of a Business Enterprise have


supported using price-level accounting. However, price-level accounting was strongly rejected by the Securities and Exchange Commission (SEC).

On the other hand, replacement cost accounting is primarily concerned with relative changes in value of different assets. This is said not to be misleading because it represents the current market values. Consequently, there is a strong tendency among many accountants to use current value as a basis of valuation theory. Edwards and Bell, Chambers, Sprouse and Moonitz, and many other writers are supporting one or more approaches to current value accounting. Present value or discounted future cash flow value, replacement value, and realizable value are different approaches to current value accounting. In the last two decades, we have experienced increasing support for the current value concepts. This support has come both from theoretical grounds and


from empirical research. (See related studies in Chapter III.) The 1966 AAA Committee to Prepare ASOBAT recommended current value information as supplementary data rather than substitute data. The Committee's view was as follows:

A principal criticism related to deficiencies of historical cost as a basis of predicting future earnings, solvency, or overall managerial effectiveness. We find historical-cost information relevant but not adequate for all purposes.32

Current value has been applied and accepted in different countries throughout the world.33 This evidence could support the Committee's view.

After the Crossroads

Sterling states:

We accountants do not resolve issues, we abandon them. I do not mean to imply that we ignore issues, quite the contrary. We debate them long and loud. However, the debate, instead of coming to a resolution, continues until another issue comes along which is more controversial, and then we forget the former issue.34

In a continually changing environment, one might ask in what direction are we accountants going: Is it toward historical value, regardless of its criticism? Is


it toward purchasing power accounting in order to have a common unit of measurement? Is it toward some concept of current value accounting? Or a combination of these?

The success of accounting is related to its role as the language of business. Accounting tries to communicate through its media to informed parties who are interested in financial reporting. When the language is clear and realistic, better communication will result. Accountants have found themselves in a dilemma. Historical data and price-level adjusted financial statements still do not reflect all changes in reality. Effective communication can be significantly improved by the accountants' development of sound valuation theory. Perhaps current asset value is a step in the right direction. This approach has many advantages.

Advantages of Current Value

Hendriksen pointed out several advantages of current value over historical value as follows:

1. Current cost represents the amount the firm would have to pay today to obtain the asset or its services; therefore, it represents the best measure of the value of the inputs being matched against current revenues for predictive purposes.

2. Separation of gains and losses from holding of assets and the recognition of profit and loss from operations.

3. Current cost represents the value to the firm if the firm is continuing to acquire such assets.
4. Current cost expressed in current terms is more meaningful.35

The same recommendations have been set forth by Sprouse and Moonitz.36 Some of the basic arguments supporting current value are:

1. It provides a better measure of efficiency.
2. It is an approximation of the service potential of the asset.37
3. It takes into consideration the maintenance of plant and equipment.
4. It generates information which might be better for prediction.38
5. It applies specific indexes which make this concept more verifiable and renders reality more accurately.39

One could agree with the supporters of current value who believe that it provides more useful managerial

35Hendriksen, op. cit., p. 268.
and investment information than historical data since supporters of each valuation concept claim its usefulness. However, selection between alternatives could be based not only on the usefulness concept, but also on the objectivity and predictive ability in making a decision regarding such an alternative.

One major disadvantage of current market value is that market prices are not always available. This is especially true for unique-type assets.

In recent years, current value accounting data have been suggested as either supplements to conventional historical data or as separate sets of financial statements. This view tries to offset the deficiencies and conservatism of historical data.

Current Developments

Current developments relating to the requirements for replacement value accounting disclosures from the SEC have created widespread interest in current value accounting measurement techniques.

41 Kieso and Weygandt, op. cit., p. 454.
Necessity is the mother of invention. Stone points out:

I suggest that we do not wait. . . . However, I believe that rules for this type of experimental financial statement must be developed through experimentation. Just as high heels were invented by a girl who was kissed several times on the forehead, accountants must invent statements which will meet the need of users.43

It has also been suggested that current value accounting be used immediately, despite a lack of rules and guidelines. In other words, accountants are seeking, through the adoption of current value financial statements, to provide the user with more useful information which can improve the user's ability to predict and make better decisions.

Need for Empirical Research

Enthusiasm has led supporters to suggest applying current value accounting before any kind of research has been conducted.44 Another view should be mentioned:

The applicability of different valuation bases for different items has not been sufficiently studied or researched.

. . . Current value information may be significantly more relevant to users than historical costs. However, current values and changes in current values


44 Ibid.
should be reported in the financial statements for selected items only in a transitional state until a more relevant valuation scheme than historical cost is developed.\textsuperscript{45}

These two groups have one common demand—the need for additional research. The SEC's requirement for current value disclosures has created the need for a reliable method of valuation. This is true when there are no market prices available, especially in the case of unique-type assets such as industrial and commercial real estate.

Appraisal value has frequently been suggested as a good approximation of market value for those unique-type assets where no established market is available. The purpose of this study is to empirically investigate the reliability of appraisal methods as estimates of current value.

The study attempts to contribute to the development of the field and to provide further empirical evidence of the reliability and predictability of current value accounting. It also presents the perceptions of corporate executives concerning the reliability and accuracy of appraisal values.

\textsuperscript{45}"Reporting of Current Values," \textit{The Week in Review} (October 4, 1974).
CHAPTER II
CRITERIA FOR CURRENT VALUE
ACCOUNTING MEASUREMENT

Measurement

Income determination is a key process in preparing financial statements. As previously stated, income determination requires an asset valuation theory since different valuation concepts could generate different income figures. The firm's financial position depends mainly upon the values of its resources in relation to its monetary obligations, while the firm's income depends mainly upon the value of assets and services used versus the value of assets and services obtained.

It is important to note that the process of valuation is usually used as a substitute for the process of assets measurement. Instead of using the valuation of assets, however, it is desirable to use the measurement of assets. Professor Robert T. Sprouse has stated: "In recent years, the terms measure and measurement have found increasing use in the accounting literature as substitutes
for value and valuation."¹ Several reasons were given for this substitution:²

(1) the concepts of value and valuation have not been established and defined;
(2) value and valuation concepts arouse emotional reactions;
(3) measurement connotes a more objective approach; and
(4) measurement has attained social prestige.³

Comparing value and valuation with measurement, Sprouse also stated:

Measurement, on the other hand, is an innocuous term as well as a prestigious one; it is not branded with the emotional stigma attached to valuation. At the same time, when it is not used merely to avoid coming to grips with a crucial factor—the relevant attribute—measurement is a legitimately useful term.⁴

In other words, income determination and a theory of asset valuation have provoked discussion of measurement


²Ibid., pp. 107-08.


⁴Sprouse, op. cit., pp. 107-08.
and measure concepts. This is especially true if these concepts are to be accepted as substitutes for value and valuation concepts.

The Significance of Measurement in Accounting

Measurement is an essential process in the accounting discipline. Bierman stated:

Accounting is the art of measuring and communicating financial information. This statement is not shocking or even surprising, yet the acknowledgment that is concerned with measurement is the first step towards a long-awaited revolution in accounting. This revolution is not restricted to accounting; it has already taken place in other disciplines where measurement is crucial.5

The Committee to Prepare ASOBAT described the accounting process as "the process of identifying, measuring, and communicating economic information."6 This emphasized the measurement process as an integral part of accounting. Because of its importance in this discipline, the question of a precise definition arises. Larson stated the necessity for such a definition:

Measurement is a term of common usage in contemporary accounting literature. However, inclusion of the word in accounting terminology appears to have preceded


any thorough going analysis of measurement's essential meaning and corresponding implications to the discipline. This is not entirely inappropriate in that precise definition of the word is highly arbitrary.\textsuperscript{7}

Nevertheless, it appears that measurement remains one of those "loose" terms, widely used in current accounting literature, which represents different things to different people. The following are some of the definitions suggested for measurement:

(1) assigning numbers to objects;
(2) any method of assigning numbers to represent properties or qualities, so long as the method implies some set of rules;\textsuperscript{8} and
(3) a type of summary expression of recording, classifying, summarizing, and interpreting functions.\textsuperscript{9}

One might argue that despite the significance of the term, measurement will continue to represent diverse methods to those involved in particular projects.

As accountants usually measure items to be presented in financial statements, the measurement process


\textsuperscript{9}Larson, \textit{op. cit.}, p. 38.
involves, first of all, determining what is to be measured. One might agree with Peter Caws that "measurement presupposes something to be measured, and, unless we know what that something is, no measurement can have any significance."\(^{10}\)

The writer believes that a knowledge of the items to be measured is not sufficient to establish a criterion for income determination and valuation theory. For example, if one needs to measure the cost of depreciation on an asset in determining net income, he must first decide what kind of value to place on that asset—historical, current, etc. Therefore, unless accompanied by some kind of criterion for evaluating accounting alternatives of measurement, the process will not be significant.

**The Structure for the Measurement Process**

In an attempt to establish a basic structure for the measurement process, Kircher identified the following elements:\(^{11}\)


(1) Determination of the objective of the business entity in terms that will be susceptible to some sort of quantification.

(2) Determination of relevant factors to attain the objective. For example, in considering the best and cheapest means of traveling across a river, certain alternatives—such as a bridge, a ferry, or a tunnel—will be presented.

(3) Selection of key aspects which are quantifiable.

(4) Choice of measuring method and unit.

(5) Development of scales.

(6) Application of the measuring unit.

(7) Analysis of the measurement.

In another attempt, Churchman tried to reconsider some of the well-known aspects of measurement in light of a tentative proposal. His proposal was that the function of measurement is to develop a method for generating a class of information that will be useful in a wide variety of problems and situations.\(^\text{12}\) Decisions to be considered are:

(1) the language used by the measurer to express his results;

\(^{12}\text{Churchman and Ratoosh, \textit{op. cit.}, pp. 83-94.}\)
the objects and environments to which his results will apply and function within;

the uses of the results. Standardization will minimize adjustments when time, place, and people change; and

the evaluation of the uses of the results. As accuracy is a relative issue dependent upon the individual biases of the decision maker, control provides optimal information about the legitimate use of measurements under different circumstances.

The fundamentals and proposals provided by Kircher and Churchman and Ratoosh are worth considering, even though the issue here is to analyze the measurement process. A conclusion which could be drawn from Churchman and Ratoosh's impression is that the measurer is not only caught between at least two desirable aims, but he must also decide on numerous procedures and issues. He has to determine the objective, relevant factors, key aspects, and other pertinent information regarding the measurement. To emphasize any one item is to sacrifice the others.

Suppose a piece of equipment has to be measured. What dimension actually needs to be determined—length, width, height, or weight? If the value of equipment must be established, does one consider market value or book value? Sprouse stated:
When an accountant refers merely to the "measurement of assets" he is either consciously avoiding or carelessly omitting specification of the attribute to be measured—surely a crucial factor. The number of certain kinds of assets can be measured—so can the volume of certain kinds of assets, the weight of certain kinds of assets, the area of certain kinds of assets, and so forth.¹³

Income and wealth are particularly dependent upon the choice of measurement rules.¹⁴ Since no "correct" measurement rule exists, the accountant must exercise his own judgment in deciding whether to apply a certain rule in a particular circumstance.¹⁵ In order to eliminate these individual decisions, it is essential that a solid measurement process and an evaluation criterion be established. Such a process will be vital to valuation theory because it will greatly reduce the personal choices the accountant is often called upon to make.

**Measurement Constraints**

The measurement function is often used in the dynamic business world of today, but the ever-changing environment places constraints on this process. These


¹⁵Ibid., p. 222.
constraints arise because of uncertainties in the business environment, conservatism, instability in the monetary unit, and a lack of criteria for evaluation.

**Uncertainty**

Financial data generally assume or expect that entities will continue their existence in the future. Past, present, and future expectations and predictions are to be combined in analyzing and presenting these data. Hendriksen sensed the vulnerability of these assumptions when he noted:

> The major measurement constraints arise because economic data are presented on the assumption that they have some relevance for a prediction of the future. Since the relationship between the present and the future is generally highly uncertain, it is generally difficult to determine the relevant measurements for this purpose. 16

Measurement in a highly uncertain business environment can often result in only a tentative estimate. For example, the allocation of depreciation expense assumes the estimate of the useful life of the asset and the salvage value are correct. While this situation should not prohibit making as reliable an estimate as possible, corrective action or proper correction should be made when elements begin to be known with certainty.

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Conservatism

This concept has definitely influenced asset valuation theory, but it has also given rise to such contradictions as recognition of expenses sooner and recognition of revenues later. Another aspect is the tendency to understate both income and net assets.

Though uncertainty is one of the main bases for conservatism, several arguments for supporting this concept can be cited:

(1) Overstatement of profits and assets is more dangerous for business and users of financial statements than understatement.

(2) Accountants handling huge volumes of data face two kinds of risks— that of reporting data which prove to be false and that of not reporting what might subsequently prove to be true. Consequently, the first risk is more serious with regard to liability than the last.

(3) Pessimism by accountants is necessary to offset both management's and the owner's optimism.

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18 Hendriksen, *op. cit.*, p. 113.
Unstable Monetary Units

Financial statements have traditionally been expressed in monetary units. If the value of the monetary unit is stable over a period of time, the measurement process in terms of money will not be subject to the confusion arising from subsequent changes in money value (inflation). The effects of inflation are far reaching:

Inflation, which is the decline in the purchasing power of money as the general price level of goods and services rises, affects most aspects of economic life, including investment decisions, wage negotiations, pricing policies, international trade and government taxation policy.19

As Parker pointed out, "substantial inflation is with us and it is imperative that no more time should be lost in securing its accounting recognition."20 A large number of accountants believe it is more accurate to report financial statements in monetary units that have common purchasing power rather than in unadjusted dollars. Recognizing this situation, Chambers stated:

If account can be taken of the change in the general purchasing power of money,


we would have a system which embraces more of the effects of external events on the results and positions of firms than does accounting on the basis of historical cost. Price-level adjusted accounting is such a system.\footnote{R.J. Chambers, "Price-Level Adjusted Accounting," The Accountant, 162 (March 19, 1970), p. 408.}

The accounting profession has devoted considerable time and effort to the problem of price-level adjustments. Although restricting accounting measurement somewhat, these adjustments can provide interested investors and creditors with financial information applicable to fluctuations in purchasing power.

\textbf{Lack of Criterion for Evaluation}

In the absence of a well-defined criterion, the measurement process must be performed under varying circumstances. A criterion for evaluation is presented below.

\textbf{Criterion for Evaluation}

Measurement needs a criterion to use as a guide for achieving accurate and verifiable results. The criteria presented here are objectivity, predictability, and usefulness.

\textbf{Objectivity}

Due to the absence of a precise definition, objectivity has different meanings for different people.
Burke has written of objectivity in terms of propositions and attitudes. Mattessich has attached both legal and scientific overtones to the concept. Paton and Littleton have emphasized verifiable and objective evidence as a test of the accuracy of financial statements.

If objective evidence were accepted, what value would be assigned to an asset costing $500 two years ago if it had a market selling price of $450 last year, a replacement cost of $600 this year, and a market selling price of $550 this year? The difficulty here is that while the evidence may be verified, the selection among these factors may introduce a personal bias.

Measurement to some authors is considered to be objective if it is unbiased and can be verified by another competent investigator.

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To Ijiri and Jaedicke, objectivity is represented by the closeness of the measures $X_1$ to the mean of the measures $\bar{X}$; while the reliability of the system is the closeness of the measures $X_1$ to a desired or alleged value $X$.\footnote{Yuji Ijiri and Robert K. Jaedicke, "Reliability and Objectivity of Accounting Measurements," The Accounting Review, 41 (July 1966), p. 481.} Bias is interpreted as the difference between objectivity and reliability.

Bias can be attributed to various sources such as rules, measurers, and users.\footnote{George J. Murphy, "A Numerical Representation of Some Accounting Conventions," The Accounting Review, 151 (April 1976), p. 277.} True or correct measurement is rarely attainable, even in physical sciences, because objectivity is simply a matter of degree. If it is to be accurate, objectivity in measurement has to achieve a high degree of verifiability and freedom from bias. If it cannot achieve absolute true value, objectivity can insure a high degree of proximity to true value.

Predictability

Beaver, Kennelly, and Voss emphasized the need for prediction in the process of decision making when they stated: "A prediction can be made without making a
decision, but a decision cannot be made without, at least implicitly, making a prediction." 28

Making a prediction for users in financial reporting will undoubtedly be risky if the prediction is unfulfilled. Nevertheless, accountants acknowledge the users' predictive needs. 29 Therefore, an attempt must be made to provide users with some kind of information to aid them in making their predictions. It is not necessary to predict for them, only to assist them in making these predictions. Accounting alternatives must be evaluated by their relative ability to predict. This idea has recently been supported by the growing body of empirical research. (See Chapter III.)

This criterion is necessary especially when more than one accounting alternative passes the logical tests. 30 The greater the predictive power the alternative provides with respect to a given event, the more desirable it is. For example, a valuation of assets based on generally accepted accounting principles could pass the logical tests as well as a valuation based on current

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30 Beaver, Kennelly, and Voss, op. cit., p. 677.
value. Given this criterion, one would certainly select the valuation concept that has the higher degree of predictability.

Usefulness

One of the ultimate aims of financial reporting is to provide the user with needed information. Accounting literature reveals many references to the necessity of a criterion of usefulness in the measurement process. "Almost without exception, the literature has related usefulness to the facilitation of decision making."\(^{31}\) "Accounting information must be useful."\(^{32}\)

The usefulness criterion, from the writer's point of view, is a valid one and should be considered in selecting accounting alternatives. This criterion should have the following characteristics: reliability, relevance, timeliness, comparability, and consistency of measurement. While accountants do not reject the usefulness criterion, little research has been conducted to select financial information in light of this criterion.

Trade-Off

Objectivity, usefulness, and predictability are qualities which are crucial to financial statements and

\(^{31}\text{Ibid.}, \text{ p. 678.}\)

reporting. These qualities could serve as criteria to evaluate accounting alternatives. Useful information, when provided, cannot be measured with a high degree of objectivity. For example, the investor might be interested in knowing the current value of assets of the firm rather than the historical or conventional value. If there is no well-defined market value for those assets, the valuation process or measurement procedure may not be achieved with a high degree of objectivity, but may have a higher predictive ability. Furthermore, objective data may be minimally useful. As a result, a trade-off among these factors is most likely to occur. Sprouse pointed out:

It has been asserted that the function of financial statements is to provide information that is useful in making rational economic decisions. Unfortunately, what might otherwise be the most useful information may be either not feasible (that is, not capable of practical and economic accumulation and presentation) or not objective... . On the other hand, information that is feasible to provide with the highest degree of objectivity may not be very useful. 33

Bierman is willing to sacrifice some degree of objectivity for useful information:

The misconception held by some, that accountants should be able to present the one true measure, has hindered progress in the reporting of financial

33Sprouse, op. cit., p. 112.
information. . . . The goal of the accountant should be to present useful financial information arrived at in a fair or reasonable manner. Instead of fair we could say "objective" if objective is not interpreted in the conventional sense of the accountant. 34

While objectivity is a matter of degree, usefulness is a criterion to utilize. Some accountants, such as Bierman, are willing to exchange one for the other. Therefore, those who favor historical acquisition costs as a basis for valuation place emphasis on the need for objectivity, while those who prefer using some form of current value place emphasis on the usefulness of such information. 35 Interestingly enough, it appears that improvement in usefulness could be achieved by improving the degree of objectivity, thus synthesizing the effectiveness of both approaches. Paton and Littleton express this view:

So long as some accounting factors are subject to unconvincing determination, and verification is in some measure incomplete, there is need for improvement. The first steps toward improvement lie in the clear recognition of the varying degrees in which objective determination may be applied. On that basis the most objective facts can be given increasing preference and efforts can be made to make the least objective more objective. 36

34 Bierman, _op. cit._, p. 502.
35 Sprouse, _op. cit._, p. 112.
36 Paton and Littleton, _op. cit._, p. 19.
Objectivity, predictability, and usefulness are still crucial issues. The question of trading off should be answered in light of these issues.

Methods of Measuring Current Value

Before discussing the methods of measuring the current value of assets, it is necessary to differentiate the concepts of current value accounting as compared with current purchasing power accounting and historical or conventional accounting. Confusion between these kinds of accounting still exists. Rosenfield noted this confusion by stating:

Many accountants confuse general price-level restatement and current value accounting. Some apparently believe that the methods are incompatible alternatives. ... Others apparently believe that general price-level restatement is primarily a means of approximating current value or that current value accounting is primarily a means to compensate for inflation.37

Some writers tend to mislead the reader when presenting their views. Accounting literature often suggests that these methods are incompatible alternatives or that one is a step or an approximation of the other. References by other writers clearly indicate the distinctions between the three methods. Platt stated:

The debate as to whether the effect of inflation is better recorded in accounts by the current purchasing power (CPP) or the replacement cost (RC) method is not an accounting problem, but a question of accounts philosophy.\footnote{A.J. Platt, "Replacement Cost Accounting: A Justification," The Accountant, 172 (February 13, 1975), p. 202.}

Bierman also commented that:

There are three basic viewpoints in accounting literature as to how assets should be recorded. At one extreme are the adherents of historical cost and at the other extreme the adherents of value accounting. Somewhere in between the extreme positions are those accountants who want to adjust cost for price-level changes.\footnote{Harold Bierman, Jr., "Discounted Cash Flows, Price-Level Adjustments and Expectations," The Accounting Review, 46 (October 1971), p. 693.}

Historical or conventional accounting uses units of money or original costs that are sacrificed to obtain assets or resources as standards of comparison.

Current purchasing power accounting changes the standard of comparison used in order to have monetary units with the same general purchasing power. This method attempts to compare values of assets or resources being measured by using the common dollar that has the same general purchasing power.

Current value accounting uses specific rather than general indexes.\footnote{Alfred M. King, "Current Value Accounting Comes of Age," Financial Executive, 44 (January 1976), p. 18.} It stresses the changes in the
relationship of assets or resources. Since this research is concerned with the reliability and predictability of appraisal methods in determining current value, emphasis is placed on different methods of measuring current values.

The following section attempts to identify the methods of measuring in current value accounting.

Current Cash Equivalent, Net Realizable Value, and Liquidation Value

The first model basically proposed by Chambers is a single measurement concept for resources or assets. Exit value or current cash equivalent is the estimate of cash that can be realized if the individual assets are sold (sacrificed). This method represents the present realizable prices of the assets. Present realizable value differs from net realizable value in that selling expenses are subtracted from selling price to obtain net realizable value. However, both net realizable value and present realizable value are different from liquidation value which results from forced sale.

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Current Replacement Value

This method was proposed by Edwards and Bell.\textsuperscript{43} Products are produced continuously, and sufficient provision must be taken from revenue to replace assets used up in periodic production.\textsuperscript{44} This emphasizes the continuity of the business organization and maintenance of its productive capacity. Singh pointed out that replacement does not mean replacing an identical asset. Rather, he stated:

Replacement cost here does not mean actual replacements but just that capital can be exchanged for an identical collection of goods or it allows for the maintenance of equivalent operating capacity.\textsuperscript{45}

The supporters of this method emphasize the survival or going concern concept. In addition, they believe this method will separate operating income from holding gains.

Depreciation expenses charged to revenue are related to the current replacement value of assets during that year. If prices rise continuously, total depreciation will amount to less than the replacement


value at the end of the useful life of assets. This phenomenon is referred to as the "depreciation gap."\textsuperscript{46} Technically, the firm will be unable to replace their assets without additional finance, but because firms replace their assets continuously, this situation is not always true.\textsuperscript{47} Consider a firm owning ten identical machines, each costing the same and having a useful life of ten years with no salvage value. If the firm has to replace one machine per year, then no matter how much the depreciation gap, one-tenth of the replacement value of the machines for each year will still be sufficient to buy a new machine.\textsuperscript{48}

Discounted Future Receipts

Current value accounting designates replacement value, selling price value, and net discounted future receipts.\textsuperscript{49} Discounted cash flow or future receipts is defined as "an estimate of present value to an investor of the future earning power of the assets."\textsuperscript{50} This method

\begin{itemize}
\item \textsuperscript{46} "Current Value Accounting and the Depreciation Gap," \textit{The Australian Accountant}, 46 (August 1976), p. 380.
\item \textsuperscript{47} Ibid., pp. 380-81.
\item \textsuperscript{48} J. Vos, "Replacement Value Accounting," \textit{Abacus}, 6 (December 1970), p. 137.
\item \textsuperscript{49} Rosenfield, \textit{op. cit.}, p. 63. See also W. von Bruinessen, "Bases of Accounting Other than Historical Costs," \textit{The Accountant}, 167 (October 19, 1972), pp. 484-86.
\item \textsuperscript{50} King, \textit{op. cit.}, p. 18.
\end{itemize}
includes an estimate of earnings in the future, a rate on investments, and a risk factor. In addition to estimate risk and future uncertainty, this method provides the current or present value, but not the value which is determined by the market forces. For purposes of this study, present value will not be included in the concept of current value accounting.

Appraisal Methods and Techniques

Appraisal methods have been widely used in commercial and industrial real estate. Several of these appraisal techniques are described below.51

(1) Comparison, known as the market data or the comparative approach, is an appraisal technique by which the market value estimate is predicted upon prices paid in actual market transactions and current listings. It is a process of correlation of recently sold properties which are similar.

(2) Summation, or cost approach, is a technique in which the estimate includes the value of land as vacant land, plus the depreciated replacement cost of the improvements.

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According to some writers, this method is superior.

(3) Capitalization, also known as the income approach, is an appraisal technique whereby the expected net income is processed to indicate the capital investment which yields the net income.

Entreken and Kapplin, even though they assume the superiority of the income approach, agree that this method is not a proper estimate of market value.\textsuperscript{52} Hanford has commented on the relative value of such an approach:

Some very eminent authors and appraisers have questioned, in times past, the preference of the income capitalization approach over the market data (comparable sales) approach to value. It has been the opinion of some that the market data approach leads to the most reliable market value conclusion.\textsuperscript{53}

Hartman, too, has expressed a preference for the market data approach:

This technique is considered far superior to the cost approach, . . . This approach is also superior to the income approach,


Otherwise, the income approach becomes an academic exercise involving hypothetical considerations.\textsuperscript{54}

The appraiser usually tries to estimate the fair market value which a buyer and a seller are willing to accept as exchange value. He uses different methods and techniques, but his primary objective is to reach an estimate of fair market value. Although appraisal methods could be used as another way of estimating current value, accountants have failed to give sufficient consideration to these methods. Perhaps the reason is as Barrett points out:

We did not list appraisal value as a concept worth serious consideration for one fundamental reason: the appraiser is generally acknowledged to use the five possible bases already listed in arriving at the appraisal value. In particular, economic value, market value, and price-index replacement cost bear heavily upon the appraisal value decision.\textsuperscript{55}

\textbf{Current Value and the Criterion for Evaluation}

Financial statements prepared according to current value accounting might be compared with those prepared according to generally accepted accounting principles.


Objectivity, predictability, and usefulness are the criteria used to evaluate the different approaches.

**Objectivity**

The valuation theory based on current value accounting has often been criticized on the ground of its lack of objectivity. In other words, it is not verifiable and involves personal bias. Critics point to accounting based on GAAP methods as being totally objective. Several studies have examined current value accounting in light of this criticism.

McDonald's study in 1968, McKeown's study in 1969, Sterling's study in 1971, and Parker's study in 1975 all revealed that financial data based on GAAP are no better than current value accounting, especially when there are well-defined market prices. If, however, there are no well-defined market prices for a unique type of asset, appraisal techniques can be utilized to fill the gap adequately. Parker remarked on the objectivity of current value accounting:

> Thus, actual book and market values form the data sets which, within the context of this study, provide empirical evidence of the superiority of exit values over traditional book values with respect to

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criterion of comparability and objectivity. 57

Current value accounting can be used significantly as a separate alternative to historical value accounting with a high degree of objectivity.

Predictability

Current value accounting, at least from a theoretical standpoint, has the merit of predictability. Zeff argues that current value income, from the viewpoint of future earnings prediction, is superior to historical cost systems. 58 Hendriksen emphasized the predictive ability of the current value concept over the historical value concept. 59 Edwards and Bell stated:

Current operating profit can be used for predictive purposes if the existing production process and the existing conditions under which that process is carried out are expected to continue into the future; current operating profit then indicates the amount that the firm can expect to make in each period over the long run. 60

Predictability as a criterion is crucial. It is evident that additional research is needed in current


58 Stephen A. Zeff, "Replacement Costs: Member of the Family, Welcome Guest, or Intruder?" The Accounting Review, 37 (October 1962), pp. 620-25.

59 Hendriksen, op. cit., p. 268.

60 Edwards and Bell, op. cit., p. 99.
value accounting to reveal the extent of its predictability.

**Usefulness**

Accountants who support the current value concept argue its usefulness:

In recent years, we have heard with increasing frequency that financial statements could be made more useful through the reporting of current cost or price-level adjusted cost information in addition to, or in lieu of, historical cost information.61

This conclusion is without prejudice to what the writer believes to be a strong case which can be put for the even greater usefulness of a full accounting for current values.62

Supporters are sometimes willing to trade usefulness for less objective information. Since research findings have proved that current value accounting is more objective than historical value accounting, there should be no need for such a trade-off in many cases.

**Summary**

Income is perhaps one of the most useful figures to report in the financial statement. Income determination needs a supporting theory of valuation. Value and

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valuation have been used as alternatives to measure and measurement because of their social prestige and because they do not arouse reactions.

Measurement is significant because accounting is a measuring and a communicating discipline. After examining the significance and structural aspects of measurement, it was found that the measurer must decide among several issues. Therefore, some kind of criterion to evaluate these alternatives is needed. Measurement is often hindered by such problems as conservatism, an unstable monetary unit as a standard of measurement, risk of uncertainty, and a lack of criterion for evaluation. With regard to a criterion for the measurement process, consideration should be given to objectivity, predictive ability, and usefulness.

Appraisal methods and techniques as a part of current value accounting have been introduced. The reliability of these methods will be tested empirically in this study. References to all current values have been cited. The popular conception that historical value accounting is more objective while current value accounting is more useful has been rejected by several studies. Instead, research indicates that current value accounting is often more objective and useful than historical value accounting.
CHAPTER III

REVIEW OF RELATED STUDIES

Related Empirical Research

A survey of the literature revealed very few empirical studies relating to current market value accounting or current appraisal values. There are several studies that use predictive ability as a criterion for evaluating accounting information models.

The methodology of research using the predictive ability criterion has succeeded in relating reality of accounting data. A more important goal is the disclosure of evidence that indicates the quality of the methodology has been improved with every new investigation and that this criterion has proved to yield a valid basis for evaluation. Studies which used the predictive ability criterion are discussed later in this chapter. Current market value and appraisal methods as estimates of current value were not subject to any research regarding the criterion of predictive ability on a nationwide basis.

Very few studies have been conducted with regard to the application of either current market or appraisal
value to accounting information. Current market value was studied in different aspects, such as its usefulness, objectivity, and desirability.

Studies in Current Market and Appraisal Values of Assets

Financial statements based on historical costs often fail to agree with other evidence of economic reality. As a result, the use of current value accounting reports has been suggested. At the same time, these reports have been criticized as being subjective.

In his study, Dittrich attempted to empirically evaluate the relative objectivity of the appraisal process as one source of current accounting value.¹ The Department of Highways of the State of Ohio was chosen as the specific state highway department from which Dittrich selected 53 real property parcels having an average appraised value of approximately $110,000 each.

Although Dittrich's study appears to be similar to this research effort, there are four major differences. In Dittrich's study:

(1) appraisal values were not compared with other data, such as book values, selling values, and so forth;

(2) the appraisal values used could not apply to commercial and industrial properties;
(3) the appraisal values were not studied under changing economic conditions; and
(4) the appraisals were not extended to include a nationwide sample.

Dittrich's findings were that:
(1) subjectivity was operative within the extent of the array of somewhat equally contendable valuations;
(2) the frequency of personal bias approached 100 percent; and
(3) the representative extent of personal bias equalled 30 percent of the asserting interest.

In the Estes study, a mail questionnaire was used to determine the expected usefulness of current value information for various classes of assets.\(^2\) The questionnaire was sent to 300 members each of the National Association of Bank Loan Officers, Robert Morris Associates, the Institute of Chartered Financial Analysts, and the Institute of the Financial Executives. Samples were randomly selected and 338 replies were received.

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Estes found that current financial reports are deficient in that they do not present current values for assets. This study has been criticized on the ground that it did not include the user-groups for whom the published annual statements were originally prepared. 3

McDonald's study was aimed primarily at determining the feasibility of using market prices in accounting reports. Case questionnaires were mailed to two sample groups of accountants. 4 The accountants were asked to:

(1) measure the net realizable value of a fleet of automobiles at the end of each of four years; and

(2) select a depreciation pattern according to generally accepted accounting principles for the fleet and estimate the necessary parameters, i.e., useful life, salvage values, and so forth.

The conclusion of McDonald's study indicated that the use of current value results in less diversity of


measurement than under current practice. This conclusion is significant in that it could possibly be extended to include all types of assets where market data are available. However, it cannot be extended to include unique-type assets such as commercial and industrial properties where no market or objective prices exist.

McKeown's study attempted to test the applicability of Chambers' model in asset valuation rules using exit value rules (net realizable value-assets and discounted present value-liabilities). A medium-sized road construction company was chosen as the study subject since the model should be feasible for a company of this type. The primary measurement method for plant assets was multiple linear regression based upon auction prices.

The results of McKeown's study showed that measurements under the revised methods were more verifiable than measurements of alternative methods under generally accepted accounting principles. McKeown concluded that, because of the marked difference in the amounts presented, an informed reader of the revised statements would probably form a significantly different opinion than he would have had he read the conventional statements.

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Several studies used the case study method to investigate the applicabilities of various models of current value accounting to one company. This differs from the studies considered here.

Brenner's study was primarily concerned with the inclusion of changes in current value in reported earnings per share, i.e., agreement or disagreement to include increases in market value of land owned by a company in earnings per share. In addition, an investigation of whether current value information should be supplementary was performed.

In this study, 4,000 questionnaires were sent to three user-groups, as follows: 2,000 to stockholders, 1,000 to bankers, and 1,000 to analyst groups. A second mailing was used to test for possible bias between respondents and non-respondents.

The results of Brenner's study indicated that a majority within the banker and financial analyst groups

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disagreed with a current value concept of earnings per share. Within the stockholder group, there was neither a majority for nor against this concept.

Another important finding was that "if the sampled groups are representative of their respective populations, the three populations are different to a statistically significant degree."^8 The majority desired current value information in a supplemental form.

Finally, Brenner stated:

Future research should be directed toward the specification of differences in information needs of various user groups. If the differences are significant, this could suggest the need to move toward separate financial statements tailored to the specific needs of each user group.9

Even though Brenner's study involved more time, effort, and cost to include stockholders, his findings were worth these expenditures as the study considered a usually forgotten group of users.

Hankins interviewed 22 security analysts to determine their use of the current value of long-lived assets.10 His findings showed that depreciation charges

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^9 Ibid., p. 166.

in income statements received considerable attention; the current value of fixed assets is useful; the method used to estimate current values must be fully explained; and analysts require this matter to be included in the auditor's opinion.

The study conducted by Sterling attempted to examine the relative merit of fair market and historical values with respect to univocal versus different for each observer, objective versus subjective, and verifiable versus not subject to verification characteristics.11

Questionnaires were sent to a random sample of 500 certified public accountants in the United States. The installment purchase of a depreciable asset (a ten-key Monroe printing calculator) was described. Information concerning the date of purchase, price tag, given discount, monthly payments, and final selling price was given to the accountants. The respondents were asked to provide information on the depreciation method, capitalized cost, salvage, and year of life that was best for book value as opposed to tax purposes. The return average was 26 percent and the final usable sample size was 23 percent.

Sterling concluded:

From the results of this study, we would conclude that historical costs are not univocal or verifiable; current values are probably no worse with regard to these characteristics. He added, with certain reservations however, that for certain types of assets with an access to well-established market price indicators, current values are more objective than historical values. Current values of assets with markets that are not as well-defined would be less objective.

A significant reservation made by this study was that while the respondent accountants selected had considerable experience in calculating historical value accounts, they were not expert in estimating market value. It is probable that if they had an equal amount of experience in estimating market values, there would be a lower deviation in current value estimates.

In the present study, data concerning current value estimates made by experts (professional appraisers) are compared with book value information.

Garner, using a nationwide mail questionnaire, studied the need for price-level and replacement value data. The study sample consisted of the following:

12Ibid., p. 220.
40 union officials, 50 Financial Analysts Federation members, 40 American Bankers Association members, 40 Federal Government Accountants Association members, and 36 Grocery Manufacturers Association members. The study failed to include stockholders. Seventy-seven percent of the questionnaires were returned (160 responses).

This study attempted to determine whether financial statements, as currently prepared, provide sufficient information for users. It also investigated the types of data needed, whether such data were accurately measured, and the form of presentation of such data in financial statements when sufficient information is not provided.

It was found that over 25 percent of the respondents felt they need replacement value data for some assets, as well as price-level adjusted information. As the users indicated, information could be prepared in supplementary statements. More support was given to accurately measure replacement value for some assets than to accurately measure price-level adjusted information. Furthermore, users believed that the AICPA should act positively to encourage the reporting of price-level and replacement values.
Parker's study concerned the comparability and objectivity of exit value accounting. Exit values for 26 six-year-old calculators were compared with adjusted historical values for 26 different aged calculators. He found that exit values exhibited greater comparability and objectivity than book values. The dispersion of accounting estimates—not accounting methods—was the main cause of the lack of objectivity in book values.

Hartman and Zaunbrecher questioned the validity of Parker's study. The major sources of criticism were that (1) the exit values measured were taken from the same assets, (2) all the dealers were located in a limited geographical area, and (3) the use of a pair sample design would be a more appropriate sampling procedure.

Studies in Predictive Ability as Criterion to Evaluate

There are several research studies using predictive ability as an evaluation criterion for accounting data. This criterion has been used in a broad area range to evaluate and determine different models of firm

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securities, forecasts of different earning growth rates, solvency determinations, and other factors. This section of Chapter III investigates empirical studies which have applied the predictive ability criterion in different areas. A review of the literature revealed that current value and appraisal value data have not been the subjects of any of these studies.

**Predictive Power of Quarterly Earnings (Interim Reports)**

The SEC recently recommended that companies publish quarterly statements of earnings. This requirement is intended to provide financial data that are either supplementary to or more current than annual reports. Few studies have investigated the potential of quarterly earning reports (interim reports) with regard to their ability to forecast future earnings per share. An investigation has been made to determine whether annual financial or interim reports are to become better indicators for users.

In 1967, Green and Segall randomly selected a sample of 50 firms listed in January 1964 by the New York Stock Exchange. This number was later reduced to 46 qualified firms. Annual and first quarter earnings per share for 1959 through 1964 were considered. Using naive

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forecast models, forecasts using only first quarter reports were compared with those not using interim reports.

It was found that first quarter earning reports were of little assistance in forecasting annual earnings per share. However, Green and Segall found evidence that these quarterly reports were helpful in forecasting earnings for those companies which experience a large change in earnings.\textsuperscript{17} They concluded:

We find it difficult to distinguish between the annual forecasts taken as a group and interim forecasts taken as a group and this is true whether we look at all forecasts or at those forecasts where all models yielded forecasts and percentage errors.\textsuperscript{18}

Niederhoffer and Brown added new dimensions to the study of the predictive ability of quarterly earnings.\textsuperscript{19} Their study used first through fourth quarter reports rather than first quarter reports only. Naive models were also used in their study.

Ball and Brown used security price changes instead of predicted annual income numbers.\textsuperscript{20} Their findings were

\textsuperscript{17}Ibid., p. 55.
\textsuperscript{18}Ibid., p. 49.
very similar to those of Brown and Niederhoffer. They concluded that the annual report does not rate highly as a timely medium since most of its content (85 to 90 percent) is captured by more prompt media which perhaps includes interim reports.\(^{21}\)

In an experimental study, Brown and Kennelly confirmed the earlier research by Ball and Brown. They found that:

1. the annual report does not cause an unusual jump in the abnormal return index in the month of release; and
2. the quarterly report data are useful in predicting aggregate abnormal security returns of individual firms and predictive accuracy of the earnings per share series is improved by 30 percent to 40 percent by reporting quarterly.\(^{22}\)

The time-series behavior of quarterly earnings, sales, and expenses has also been subject to several empirical studies.

\(^{21}\)Ibid., pp. 176-77.

In 1975, Watts attempted to analyze the time-series of quarterly earnings behavior using a sample of firms with 18 to 50 observations of each firm. He found evidence of seasonality in quarterly earnings changes. Furthermore, adjacent quarterly earnings changes tended to be related rather than independent. This latter conclusion supported Beaver's finding that errors of quarterly forecasts have positive serial correlation.

In an examination of the time-series properties of quarterly earnings, Lorek, McDonald, and Patz studied 32-52 quarterly earnings observations of individual firms. They found that seasonality is important and that seasonal differences or parameters are necessary to analyze data. This observation is consistent with Watts' conclusion.

A similar conclusion was stated by Griffin in 1976 as a result of applying cross-sectional

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autocorrelation and partial autocorrelation techniques on a sample of 94 firms over the 1958-71 period.26

Foster extended his study to include the time-series properties of quarterly earnings, sales, and expense series using a sample of 69 firms over the 1946-74 period. He examined predictive ability to forecast future values of the same series and to approximate the market's expected quarterly earnings when examining the market's reaction to accounting data.27

The major results of his study were:

(1) Each quarterly series appears to have both (a) a seasonal, and (b) an adjacent quarter-to-quarter component. A forecast model which considered both (a) and (b) yielded more accurate one-step-ahead forecasts than models which considered only one component.

(2) A model with quarterly accounting data succeeded in relation to a model with more detailed information of each firm's autocorrelation and partial autocorrelation models.


A strongly significant association existed over the 1963-74 period between the signs of unexpected quarterly earnings change and risk-adjusted security return in the 60 trading days in a firm up to and including the announcement date of the quarter's earnings.\(^{28}\)

**Predictive Power in Corporate Bond Ratings**

There are two studies which used corporate bond rating—one by Horrigan, the other by West. Horrigan's study considered various prediction models by correlating or regressing fifteen financial ratios with bond ratings of the sample firms.\(^{29}\) One-year data were utilized in computing the ratio values.

The results obtained from this sample were applied to two subsequent samples: (1) firms which received bond ratings during the period 1961-64, and (2) firms whose previously assigned ratings were changed during 1961-64. Horrigan successfully predicted the new bond ratings in over 50 percent of the cases, and commented:

\(^{28}\)Ibid., p. 18.

In conclusion, accounting data and financial ratios have been found to be useful for the determination of corporate bond ratings, are sufficient to correctly predict over one-half of samples of bond ratings. The study conducted by West used sophisticated models in which some non-accounting variables were included. These variables are designed to determine the risk premium and are highly correlated with bond ratings.

West concluded:

Since the two perform about equally well in this regard, the easier calculations of Horrigan's model may be the more reasonable criterion to follow in choosing between them.

He admitted that his model is superior on the grounds of theoretical foundation and Horrigan's empirical quality, but not on the critical matter of predictive accuracy.

Financial Ratios as Predictors of Failure

Financial ratios have been used to predict a firm's success. They can also be tested to predict failure.

30 Ibid., p. 52.
32 Ibid., p. 125.
33 Ibid.
In 1966, Beaver selected a sample of 79 failed and 79 non-failed firms from Moody's *Industrial Manual* for the period 1954-64. Firms were chosen from the same industry and the same asset-size class. Thirty ratios were used as predictors.

Beaver's findings indicated that cash flow/total debt and net income/total asset ratios were especially effective in predicting failure.

In another study two years later, Beaver used the same sample firms, but included a five-year period prior to failure. He noted the changes capability in the security prices of shares in order to predict firm failure.

After completing the study, Beaver concluded:

1. the financial signal starts to increase as long as five years prior to failure of the firm, and
2. the price changes of stocks act as if investors rely upon ratios as a basis for their decisions and impound ratio information into the market prices.

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Using multiple discriminant analysis as a statistical technique, Altam chose a sample of 61 failed and 61 non-failed firms for his 1968 study. He developed a predictive model of five ratio categories: liquidity, profitability, leverage, solvency, and activity. These variables were chosen on the basis of their popularity in financial literature or relevance to the study.

This model proved to be extremely accurate in predicting bankruptcy. Of the initial sample, 94-95 percent of the firms in the bankrupt and non-bankrupt categories were assigned to their actual group classification. Altam found that bankruptcy may be accurately predicted up to two years prior to the actual failure, with accuracy rapidly diminishing after the second year.

Predictive Ability of Other Accounting Data

In addition to those previously discussed, predictive ability as an evaluation criterion has been applied in other areas of accounting. The following is an attempt to point out the major findings of recent studies which considered predictive ability as a criterion for the evaluating of accounting measurements.

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Several studies have successfully related accounting data to the real-life aspects of decision making.

In 1968, Greenball tried to answer the question: Do some accounting methods generate earnings estimates better than other methods? As a result of his simulation study of a sample of 110 runs, he concluded that absorption costing and direct costing methods generated or performed equally well. He further concluded that investors might be better off if they were to use accounting data rather than ignoring them simply because of their limitations.  

In his 1968 study, Staubus attempted to evaluate different methods of inventory valuation and to relate them to a discounted stock value. He found that LIFO produced inferior balance sheets and income statements. Therefore, FIFO is a more useful method for reporting to common stock investors.

An attempt to determine the effects of alternative accounting methods on security prices by using multivariate statistical techniques was made by Mlynarczyk in 1969. This study focused upon the alternatives in federal

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income tax measures for utility companies during the 1957-61 period. In conclusion, Mlynarczyk could only state:

It can be tentatively said that during the 1959-1961 period some investors did take into consideration the alternative tax accounting methods available to companies in this industry in formulating their portfolio decisions.39

In 1969, Werner performed a study to measure the relative ability of historical cost (accounting income) and current cost income measures to predict future income values. Adjustments (price indexes) were introduced to determine current income. Normal operating income before taxes was used as a variable to be tested also.40

Werner concluded that there was no clear advantage for reporting current income rather than historical income. However, he stated that reports of current income as supplementary data may have merit by assisting predicting accounting in future periods in oil and perhaps chemical industries.

Predictive power of entity versus subentity data was the subject of research in a study conducted by


Kinney in 1971. He attempted to research whether the disaggregation of consolidated earnings allow better predictions of the next year's earnings. He stated that, on the average, predictions based on segment sales and earnings and industry were more accurate than predictions based on models using consolidated performance data alone. 41

An empirical evaluation of the predictive power of purchasing-pooling accounting numbers was made by Clark in 1972. In 69 percent of the cases, purchasing methods of accounting produced numbers more closely associated with actual stock market performance than did the pooling method. Clark added that "since 31% of the clearly comparable cases showed pooling to be a better predictor, it appears there is justification for existence of the two alternatives now." 42

Summary

Although empirical research has begun to be applied in all aspects of accounting activities, more research is needed. This part of the study has tried to


revealed related empirical studies that used a similar criterion or that involved an investigation into the same subject matter as this effort.

There have been few studies in the area of current value accounting in general and in the area of appraisal values as a method of estimating current value accounting in particular. Research on this subject has focused on determining the desirability of current value accounting to different user-groups. If desirable, should current value accounting be published as a separate set of financial data or as supplemental data to historical financial statements? In addition, the objectivity, usefulness, and other characteristics of historical data were compared with those of current market value data.

When using financial groups to evaluate and estimate market values as compared with book values, writers have failed to recognize that those accountants are not as adept in estimating market value as expert appraisers. Results of findings would probably be different if accountants were as expert in estimating market value as they are in estimating book value. In other words, market value could be better estimated by expert appraisers since accountants have not yet gained sufficient experience in this area.

Only the study made by Dittrich attempted to evaluate the relative objectivity of the appraisal
process as a method of current value accounting. The major differences between that study and the present one consisted of objective, type of property, geographical, and economic considerations.

An analysis of the predictive criterion showed that it has been successfully used in competing alternatives in accounting, especially when two or more alternatives pass tests of logic. The better the predictive ability, the better the alternative.

Studies have tried to relate reality to accounting data. Different models were used and new dimensions and techniques added each time more accurate findings were developed. However, current asset values as compared with historical values have never been tested in light of this criterion.
CHAPTER IV

STATEMENT OF THE PROBLEM
AND EXPERIMENTAL DESIGN

The Problem in Perspective

Accounting is instrumental in communicating reliable financial information to both external and internal users. The financial data, in turn, enhances the user's prediction-making power and decision-making skill. It is the writer's belief that this potential quality of usefulness is one of the major functions of accounting and, as such, is a highly advantageous resource for its adherents.

In the past, financial statements have usually been presented on an historical value basis. Recently, however, there has been a growing trend to present these statements on a current value basis. As a result, those using financial statements will be provided with current asset value data. This can be achieved by recognizing the relative changes in the prices of different assets.

A major problem in determining current asset value is that current market prices are not always available. This is especially true in the valuation of
unique-type assets such as industrial and commercial real estate properties. Consequently, supporters of current value accounting need to determine a reliable, applicable, and available method of valuation on a current value basis. This need has been emphasized by the SEC's recent requirement of current replacement disclosures.

There are different approaches to the determination of the current value of assets. Appraisal methods are one approach to asset valuation for published financial reports. These methods and techniques, whether by comparison, capitalization, or summation, have been widely used for residential real estate and sometimes for commercial and industrial real estate properties.

Since appraisal methods and professional appraisals were available, this study tested the following points:

(1) the reliability of appraisal methods when applied to commercial and industrial real estate properties. Reliability was tested by comparing appraisal value to selling value;

(2) the ability of appraisal values to predict selling prices versus the ability of book values to predict selling prices; and

(3) the effectiveness of the communication process as represented by the perceptions of
appraisal methods by the top financial executives of those companies from which the SEC requires disclosure of current value information.

This study focused primarily on testing the reliability and predictive ability of appraisal methods as compared with that of book values. In addition, the study included an investigation of the views of financial officers who either supervise the preparation of or who prepare financial statements. Two reasons for this extension were: (1) accounting is a communication process as well as a financial one, and (2) "communication, meaning the transmission of information from one person to another, fails if the recipient does not comprehend the message."¹

It is important to determine how closely appraisal methods are perceived in relation to current market value. This perception is expected to have an important impact on the communication process. The SEC recognized this importance when they included financial executives on their advisory committee:

The SEC has named an advisory committee to meet with SEC staff on a monthly basis and assist it with implementation problems. . . . The committee includes corporate

financial executives, public accountants, academics, professional appraisers, and investment analysts.2

The impact of any reported data as a communication device is not only a function of its content, but also of the degree to which senders accurately perceive and communicate it to recipients. Effective organization requires effective external and internal communication. Information perception and transference are essential parts of any business organization because the type and relevance of information contained therein might influence a given decision.

Research Methodology and Experimental Design

In order to determine the opinions of top financial executives of large corporations concerning the reliability of appraisals in estimating current asset value, mail questionnaires were sent to a random sample of 250 large corporations. The questionnaires were mailed several months after the current value disclosures requirement by the SEC.

The mail questionnaire method of information gathering was chosen for several reasons. It can cover a

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wide geographical area with relatively little cost, and it eliminates some of the human error in research because it involves one person. Alternative methods involve two people in each interview. Also, as a wide dispersion of individuals was desired, it was necessary to select a large sample for the research. A mail questionnaire was the best method of reaching these individuals.

Statement of Hypotheses

It is the writer's belief that an appraisal value made by an expert (independent appraiser) could be a reliable estimate of current value. Though accountants are experienced in estimating book values, they are not yet adept in estimating current value. Given time and experience, accountants could become as familiar with current value estimation as independent appraisers.

The hypotheses tested were:

There is no difference between independent appraisal values and actual selling values of industrial and commercial real estate properties.

There is a difference between book values and actual selling values of industrial and commercial real estate properties.

There is no difference between the deviation of appraisal values and selling values made in different periods for commercial and real estate properties.

There is no difference between the deviation of appraisal values from different geographical areas.
Selected Population

The technique of selecting a scientific population sample has been widely accepted for a variety of practical and economical reasons. This technique has been used to test all kinds of independent and dependent variables. It is necessary to identify the population, to determine the size of the sample(s), to select the sample(s), and to study the characteristics which could be generated.

Since the recent requirement to disclose current value information will affect the larger companies, a population of non-financial corporations was chosen. From a list of 500 companies published by Fortune in May 1976, 250 were randomly selected for use in this study. Questionnaires were mailed to controllers or financial vice-presidents of these companies.

Content of the Questionnaire

The questionnaire consisted of two parts. The first part, questions 1 through 6, was presented in order to determine the perceptions of top financial officers on the following issues:

(1) the closeness of appraisal values of commercial and industrial real estate properties to selling prices;

(2) the differences in valuation between independent appraisers;
(3) the usefulness of appraisal values as compared with that of book values;
(4) the reliability of appraisal values from one geographical region to another;
(5) the reasonableness of appraisal values as reliable estimates of current market value; and
(6) appraisal values as the best available estimates of current value for unique-type assets such as commercial and industrial real estate properties.

The respondents were asked to express their degree of agreement or disagreement with regard to these issues. Their answers were given using a scale of: strongly agree, agree, undecided, disagree, and strongly disagree. This scale was chosen to permit measurement of attitudes in a quantitative manner.

The second part of the questionnaire was designed to provide transactions data in order to determine the reliability and predictability of appraisal values as compared with that of book values. This part requested information concerning selling price (value), appraisal value, book value, year of appraisal, state in which the appraisal was made, and a description of the property sold.
Mailing the Questionnaire and Collecting Data

Questionnaires were mailed on July 14, 1976 to the random sample of 250 top financial officers. A month later, a follow-up letter was sent to all the officers originally receiving a questionnaire, as well as a copy of the original questionnaire.

To allow sufficient time in which to respond, December 5, 1976 was selected as the cut-off date. This choice of date allowed the respondents approximately 19 weeks in which to respond from the date of the original mailing and 15 weeks from the date of the second mailing.

As a result of the two mailings, 99 questionnaires (40 percent) were returned by December 5. Of this number, there were 57 usable responses regarding Part I, for an overall response rate of 23 percent. Concerning Part II, information on 780 pieces of property was received (see Table 1). Of this number, data on 142 pieces were usable.

After careful consideration of this information, a bias was introduced if data provided from Companies A and B were fully included in the research. An equal opportunity was given to data from all companies. Some data provided by companies were not qualified for inclusion either because the appraisal date did not fall within the year of sale or because information regarding
TABLE 1

REAL ESTATE PROPERTIES
(COMMERCIAL AND INDUSTRIAL)

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>From all responses except two companies&lt;sup&gt;a&lt;/sup&gt;</td>
<td>82</td>
<td>--</td>
<td>--</td>
<td>107</td>
<td>189</td>
</tr>
<tr>
<td>From one company&lt;sup&gt;b&lt;/sup&gt;</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>From one company&lt;sup&gt;c&lt;/sup&gt;</td>
<td>--</td>
<td>140</td>
<td>231</td>
<td>173</td>
<td>544</td>
</tr>
<tr>
<td>From Company B (approved but not sold)</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>82</td>
<td>140</td>
<td>231</td>
<td>327</td>
<td>780</td>
</tr>
</tbody>
</table>

<sup>a</sup>Hereafter designated A and B.
<sup>b</sup>Hereafter designated Company A.
<sup>c</sup>Hereafter designated Company B.

A transaction contained totals rather than information on individual transactions. Such was the case for the information received from the company designated Company B. Table 2 illustrates the properties selected.

Of the questionnaires returned (42 or 17 percent), 3 were returned by the post office because the addresses were no longer valid. The remaining 39 questionnaires were returned by respondents, but could not be used for varying reasons.

Some of the reasons offered by companies for not providing information were that the company had its
### TABLE 2

**SELECTED QUALIFIED REAL ESTATE PROPERTIES**

<table>
<thead>
<tr>
<th></th>
<th>Unqualified Properties</th>
<th>Qualified Properties</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>From all companies except A and B</td>
<td>53</td>
<td>68 68</td>
<td>189</td>
</tr>
<tr>
<td>From Company A</td>
<td>35</td>
<td>-- 5</td>
<td>40</td>
</tr>
<tr>
<td>From Company B</td>
<td>543</td>
<td>-- 1</td>
<td>544</td>
</tr>
<tr>
<td>From Company B (approved but not sold)</td>
<td>_</td>
<td>_ _</td>
<td>_7</td>
</tr>
<tr>
<td>Total</td>
<td>638</td>
<td>68 74</td>
<td>780</td>
</tr>
</tbody>
</table>

appraisal from within the company, and that the company had adopted a policy to not participate in answering questionnaires. Other respondents commented:

- We prefer not to participate.
- I am very sorry to advise that we are unable to answer your questions due to the lack of time and research needed to complete this questionnaire.
- We have established a policy of not responding to questionnaires other than those received from a government agency requiring completion by law.
- We also do not have any experience in using outside appraisers for property valuation purposes.

After collecting data from the returned questionnaires, classification and tabulation were performed. Computer cards were used to process lists of selling
values, appraisal values, book values, and so forth. It was found that this information should also be computed in percentage form to remove any bias that might arise from the use of large values as compared with smaller values. Therefore, data were transferred to percentage values and presented as original and percentage data. The percentage data were added and punched to be used in different statistical tests and techniques. Further details of the kinds of procedures used and results obtained will be discussed in the following chapters.

**Variables and Their Treatment**

The three objectives of the empirical portion of this study were to discover (1) the perceptions of financial executives regarding appraisals and current values; (2) the significant difference between variables in order to test the research hypotheses; and (3) the relationships between variables in order to study the correlations among these variables necessary for prediction so that prediction models could be developed.

The major variables considered were selling value, appraisal value, and book value. Selling value (price) was considered as a dependent variable. The other variables were considered to be independent. The significant differences or relationships between variables were statistically analyzed in light of (1) changing economic conditions, particularly those of
1972 and 1975; and (2) five different geographical areas. These regions will be discussed in the Data Classification section of Chapter V.

Scope and Limitations of the Study

It is necessary in any research to limit the scope of the project because of time and financial factors. The scope of this research is restricted in the following ways.

The study is limited to industrial and commercial real estate transactions in large publicly-owned industrial corporations which were listed in 1976 in Fortune magazine. The study does not consider sole proprietorships, partnerships, small- and medium-size industrial corporations, or non-profit organizations.

The study does not consider other types of specialization in the economy such as finance companies, insurance companies, public utilities, and so forth.

Exit value was used as the dependent variable, although there are more current value accounting methods that could possibly have been used.

For practical purposes, this study was limited to a few variables. Although buyers and sellers are often affected by important information from other sources (variables), these are beyond the scope of the present study.
Another limitation of this research is the perception process of a sole group. The selected group of financial executives was chosen because they prepare or supervise the preparation of information needed for this study. This research does not consider groups such as financial analysts, independent accountants, creditors, or independent appraisers. Although they are also interested in the perception process, their views are beyond the scope of this study.

A final restriction concerns the use of questionnaires as a research media. While considerable effort and time were devoted to making the questionnaire as concise as possible without sacrificing its quality, it is still subject to the general limitations usually associated with questionnaires: the rate of response was low; the views are the respondents' and do not apply to the whole population; and the identity of respondents is usually not known.

Summary

One objective of the study was to determine the perceptions of a sample group of financial executives of large industrial corporations concerning the reliability of appraisal methods in estimating current market values. This objective was expected to emphasize that accounting is, in part, a communication process. It is the writer's
belief that this group's perception will have an impact on this process.

Another objective of this study was to test the reliability of appraisal values as estimates of current asset value. The application of current asset values has often been criticized on the grounds of reliability and availability, especially in unique-type assets such as real estate properties.

Appraisals have been used in different sections of the economy as an available and practical method of valuation. Appraisals of industrial and commercial real estate properties were selected for testing under different geographical and economic conditions. Results will be applicable as a valuation concept for commercial and industrial assets where there are usually no market prices available.

Selling price or exit value is a current value concept that is objective and verifiable. If data involving industrial and commercial real estate properties sold and appraised in the same year were collected, the reliability of appraisals as compared with that of selling prices could be tested. If tests proved that appraisals are reliable, the problem facing supporters of current value accounting will no longer exist, i.e., the problem of finding a reliable, applicable, and available method of valuation on a current value basis.
The third objective of this study was to obtain data to be used in developing predictive models of appraisals for use as estimates of current asset value. These data were essential for comparison purposes. Information concerning appraisal, selling, and book values collected was used in developing such models in light of different geographical and economical conditions in the United States. Regression techniques were used.

Of the random sample of 250 of the largest companies in the United States contacted by mail and requested to participate in this study, 99 responses were received. The overall response rate was 40 percent, with a usable response rate of 23 percent.
CHAPTER V
RESULTS OF PERCEPTION PROCESS
AND HYPOTHESES TESTING

Observation and Orientation

The research analysis and results are presented in this chapter and in Chapter VI. The presentation includes three parts: (1) the perceptions of financial executives concerning appraisal techniques as a means of estimating current asset values; (2) the hypotheses tested, their results, and their acceptance or rejection; and (3) the prediction models—simple regression (bi-variate) or multiple regression. The first two parts are discussed in this chapter; the last, in Chapter VI.

Different statistical techniques, such as regression and correlation methods and analysis of variance, were utilized. Before these techniques are discussed, a brief explanatory orientation is presented.

Data Classification

Data were studied under different economic conditions. The years 1972 and 1975 were chosen because the rates of inflation were significantly different in these
two years. The U.S. Bureau of Labor Statistics revealed that prices, according to the consumer price index, were increased by 4 percent in 1972 and by 13.5 percent in 1975.¹

Properties used from different states were grouped into five United States regions. These regions were:²

<table>
<thead>
<tr>
<th>Region Number</th>
<th>Region Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Northeast</td>
</tr>
<tr>
<td>2</td>
<td>Midland</td>
</tr>
<tr>
<td>3</td>
<td>South</td>
</tr>
<tr>
<td>4</td>
<td>Rocky Mountains</td>
</tr>
<tr>
<td>5</td>
<td>Pacific Northwest</td>
</tr>
<tr>
<td></td>
<td>Coastal Province</td>
</tr>
</tbody>
</table>

Table 3 illustrates year and region information.

**TABLE 3**

**YEAR AND REGION FREQUENCIES**

<table>
<thead>
<tr>
<th>Year</th>
<th>Region</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6*</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td></td>
<td>16</td>
<td>17</td>
<td>17</td>
<td>8</td>
<td>5</td>
<td>5</td>
<td>68</td>
</tr>
<tr>
<td>1975</td>
<td></td>
<td>11</td>
<td>26</td>
<td>13</td>
<td>9</td>
<td>9</td>
<td>6</td>
<td>74</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>27</td>
<td>43</td>
<td>30</td>
<td>17</td>
<td>14</td>
<td>11</td>
<td>142</td>
</tr>
</tbody>
</table>

*Undefined by regions. These were eliminated in the region research study.


Perception of Current Value vs. Appraisals

Perception is a crucial part of effective communication. Communication is essential to the accounting discipline. The first part of the questionnaire used in this study was concerned with the perception process.

A group of 250 top financial executives of large corporations were asked how they perceived different issues of appraisal value. A questionnaire was used to gather the data and the results of the usable responses (23 percent) are presented below. The proportion of this sample group is set forth according to the relative ratio of its agreement or disagreement. Answers were classified according to the scale: strongly agree, agree, neutral, disagree, and strongly disagree.

Closeness of Appraisal Value to Selling Price

This question attempted to determine how reasonably close the respondents believed an estimate of appraisal value would correspond to an actual selling value. Selling value was assumed to be objective or verifiable.

The question was stated as follows: "In most circumstances, the appraisal value of commercial and industrial real estate properties would be reasonably close to the selling price." The word "reasonably" was
included in the wording to emphasize the rationale concerning the closeness of such estimates. The phrase "in most circumstances" was used to determine the frequency with which close estimates occurred.

This question involved commercial and industrial real estate properties; other real estate properties were excluded. The responses to Question 1 are presented in Table 4.

TABLE 4

APPRAISAL VALUE AS RELATED TO SELLING PRICE

<table>
<thead>
<tr>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>In most circumstances, the appraisal value of commercial and industrial real estate properties would be reasonably close to the selling price.</td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>2</td>
</tr>
<tr>
<td>Agree</td>
<td>36</td>
</tr>
<tr>
<td>Neutral</td>
<td>8</td>
</tr>
<tr>
<td>Disagree</td>
<td>8</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
</tr>
<tr>
<td>No Answer</td>
<td>2</td>
</tr>
<tr>
<td>57</td>
<td>100.00</td>
</tr>
</tbody>
</table>

As shown in the table, two-thirds of the respondents agreed with the statement. Only 9 out of 57 (16 percent) felt the appraisal value of commercial and industrial real estate properties would not be reasonably close to the selling price.
These responses indicate that financial officers, who have had experience in the area of appraisal values, believe that they are reliable. This appears to be contrary to much of the thinking in accounting and may reflect the lack of actual experience, by accountants, with appraisal values.

**Substantial Difference Among Appraisers**

The second question seeks to determine whether the respondents perceived a substantial difference in appraisals between independent appraisers. The responses to Question 2 are presented in Table 5.

**Table 5**

**Substantial Difference Among Appraisers**

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appraisals differ substantiably between independent appraisers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>2</td>
<td>3.51</td>
</tr>
<tr>
<td>Agree</td>
<td>26</td>
<td>45.61</td>
</tr>
<tr>
<td>Neutral</td>
<td>11</td>
<td>19.30</td>
</tr>
<tr>
<td>Disagree</td>
<td>17</td>
<td>29.83</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>57</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Of the respondents, 49 percent believed there were substantial differences in appraisals between independent appraisers. Given the responses to the first
question, these responses may indicate that executives are not confident of all appraisals, but only appraisals by professional and competent appraisers.

**Usefulness in Decision Making**

Question 3 asked whether the respondents felt appraisal values were more useful in decision making than the book values. The responses to this question are presented in Table 6.

**TABLE 6**

<table>
<thead>
<tr>
<th>APPRAISAL VALUE VS. BOOK VALUE IN DECISION MAKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>The appraisal value is more useful in decision making than the book value.</td>
</tr>
<tr>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Agree</td>
</tr>
<tr>
<td>Neutral</td>
</tr>
<tr>
<td>Disagree</td>
</tr>
<tr>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>No Answer</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

As shown in Table 6, 74 percent of the respondents supported the view that the appraisal value is more useful in decision making than the book value. Sixteen percent were either neutral or non-answering respondents,
and only 10 percent disagreed with the statement. There were no respondents who strongly disagreed with the statement.

During periods of rapid increase in market prices, an asset's book value may not correspond with its market value. Though financial officers may experience many patterns of change in book value estimates, appraisers must continuously evaluate changes in all market forces that involve appraisals. It would seem here that the financial officers believed the appraisal value to be more useful than the book value in decision making, perhaps because they believe market forces to be the more crucial point.

Geographic Region and Reliability of Appraisal Values

The executives were asked whether they felt the reliability of appraisal values would differ substantially from one geographic region to another. The responses to Question 4 are shown in Table 7.

A large number of the respondents (44 percent) were undecided regarding this question. Seventeen of the total responses of the executives (30 percent) showed that they felt there were substantial differences in appraisals from one geographic region to another. Almost a fourth of the executives (23 percent of the total responses) did not believe there were any substantial differences.
TABLE 7
RELIABILITY OF APPRAISAL VALUES
FROM DIFFERENT GEOGRAPHIC REGIONS

<table>
<thead>
<tr>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>3</td>
</tr>
<tr>
<td>Agree</td>
<td>14</td>
</tr>
<tr>
<td>Neutral</td>
<td>25</td>
</tr>
<tr>
<td>Disagree</td>
<td>13</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>--</td>
</tr>
<tr>
<td>No Answer</td>
<td>2</td>
</tr>
</tbody>
</table>

The reliability of appraisal values will differ substantially from one geographic region to another.

Possible reasons for the respondents' reactions regarding geographic differences could be that they believe some areas to be more established, have more reputable independent appraisers, or have more stringent requirements for qualification as an appraiser.

Reliability of Appraisal Value

This question attempts to determine whether the executives perceived an appraisal value as a reasonably reliable estimate of current market value. Earlier in the questionnaire (Question 3), the respondents were asked to decide whether they felt an appraisal value was more useful in decision making than a book value. If the respondents considered an appraisal value could be an
estimate of current market value, then the conclusion
could be drawn that appraisal values are useful in the
decision-making process and reliable estimates of current
value. The responses to Question 5 are presented in
Table 8.

<table>
<thead>
<tr>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>1</td>
</tr>
<tr>
<td>Agree</td>
<td>39</td>
</tr>
<tr>
<td>Neutral</td>
<td>6</td>
</tr>
<tr>
<td>Disagree</td>
<td>8</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
</tr>
<tr>
<td>No Answer</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>57</td>
</tr>
</tbody>
</table>

Seventy percent of the respondents felt that
appraisal value is a reliable estimate of current market
value. Sixteen percent did not agree with the statement.

An analysis of the results of Questions 3 and 5
revealed that the majority of executives agreed that
appraisal value is a reliable estimate of current market
value and that it is more useful in decision making than
book value.
The reliability reaction based on the financial officers' experience perhaps denotes their confidence in the integrity of appraisers. It is possible that officers perceive them as professionals who independently evaluate many factors attached to the valuation process. Such factors include price changes in general and in real estate in particular, the status of each individual asset in particular, and all other market forces that might affect the fair market value of an asset.

**Best Available Estimate of Current Value for Unique-Type Assets**

The current market value for a unique type of asset is difficult to assign because different estimates could be used. Question 6 asked the respondents whether they believed an appraisal value was the best available estimate of current market value for unique-type assets such as real estate. The responses to this question are shown in Table 9.

Other reasons for this question were:

1. If the respondents believed appraisal values were reliable estimates of current market value, would their beliefs be changed if there were no well-defined market value?

2. If there were no well-defined market value, would this information strengthen or weaken their belief
TABLE 9
APPRAISAL VALUES AS BEST AVAILABLE ESTIMATES OF CURRENT MARKET VALUE FOR UNIQUE-TYPE ASSETS

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>For unique-type assets such as real estate, appraisal values represent the best available estimates of current market value.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>6</td>
<td>10.53</td>
</tr>
<tr>
<td>Agree</td>
<td>38</td>
<td>66.67</td>
</tr>
<tr>
<td>Neutral</td>
<td>7</td>
<td>7.01</td>
</tr>
<tr>
<td>Disagree</td>
<td>8</td>
<td>14.04</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>1.75</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>100.00</td>
</tr>
</tbody>
</table>

that current market values are the best available estimates when using the appraisal value?

An analysis of the results showed that 77 percent of the respondents agreed that, for unique-type assets, appraisal values represent the best estimates of current market value. Sixteen percent disagreed with this conclusion. Whether the appraisal was performed for a general- or a unique-type asset, the respondents' beliefs concerning this question did not seem to be altered. This is indicated by the results comparison presented in Table 10.

As shown in Table 10, a large majority of the respondents felt that the current market value could best be estimated by the appraisal value where unique-type
TABLE 10

COMPARISON RESULTS OF APPRAISAL VALUE
AS ESTIMATE OF CURRENT MARKET VALUE
(in percents)

<table>
<thead>
<tr>
<th></th>
<th>Assets in General</th>
<th>Unique-Type Assets</th>
<th>Difference (Increase or Decrease)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>1.75</td>
<td>10.53</td>
<td>8.78</td>
</tr>
<tr>
<td>Agree</td>
<td>68.42</td>
<td>66.67</td>
<td>(1.75)</td>
</tr>
<tr>
<td>Neutral</td>
<td>10.53</td>
<td>7.01</td>
<td>(3.52)</td>
</tr>
<tr>
<td>Disagree</td>
<td>14.04</td>
<td>14.04</td>
<td>---</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1.75</td>
<td>1.75</td>
<td>---</td>
</tr>
<tr>
<td>No Answer</td>
<td>3.51</td>
<td>---</td>
<td>(3.51)</td>
</tr>
<tr>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

assets were concerned. Perhaps those who were uncertain about Question 5 became more certain when such unique-type assets were involved. They may have realized the difficulty of determining current value when there are no well-defined market prices.

As the perception of appraisals has already been reviewed, the following is a discussion of the second part of this chapter. This part is concerned with a description and an analysis of the sample characteristics and results of the hypotheses testing.
Sample Characteristics

The Statistical Analysis System (SAS 72) designed and implemented by Burr and Goodnight, was utilized through the System Network Computer Center (SNCC) of Louisiana State University to analyze the data and test the hypotheses. The means procedure produced simple univariate descriptive statistics for the variables in the data, and was applied to all data in both 1972 and 1975. In addition, the regression procedure was used mainly to perform and print out tables for a least squares analysis of variance. The latter procedure was applied to test differences in appraisals between years and among regions of the United States. The results allowed a study of the characteristics of the sample and a test of the hypotheses.

A sample of 250 corporations was randomly selected from the largest 500 corporations in the U.S. Data concerning selling value, appraisal value, book value, and year of appraisal for their real estate properties were requested. The total usable sample consisted of 142 industrial and commercial real estate properties. This usable sample was provided by 28 large corporations. Characteristics of the sample in the form of mean scores are presented in Tables 11 and 12.

The three variables mainly used were selling price, appraisal value, and book value for industrial and commercial real estate properties. Appraisal/sale is the variable of appraisal value that has been changed to a percentage of sale price. In a similar way, book/sale is the book value variable as a percentage of sale price. Therefore, percentages gave equal weight to each property.

Differences between appraisal or book value and selling value were of major interest in this study. Reliability was measured by the closeness of appraisal or book values to selling prices. These differences were shown as two other variables. The last two variables represented the differences between either appraisal and selling value or book value and selling value. These differences were in percentage form.

Table 11 shows the characteristics of sample year 1972. The mean of the selling prices of 1972 properties was $281,185. This figure is higher than the mean of 1972 appraisals by $7,158, and higher than the mean for book values by $70,781. Therefore, the mean of appraisals was much closer to that of the average selling value than to that of the book value.

The mean difference between pairs of appraisals and actual selling prices was $7,158, with a standard deviation of $323,880. Therefore, the mean difference
### TABLE 11
CHARACTERISTICS OF SAMPLE YEAR 1972

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>n</th>
<th>Standard Deviation</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sale Price</td>
<td>281,185</td>
<td>68</td>
<td>488,692</td>
<td>---</td>
</tr>
<tr>
<td>Appraisal Value</td>
<td>274,027</td>
<td>68</td>
<td>463,633</td>
<td>---</td>
</tr>
<tr>
<td>Book Value</td>
<td>210,404</td>
<td>68</td>
<td>341,572</td>
<td>---</td>
</tr>
<tr>
<td>Sale - Appraisal</td>
<td>7,158</td>
<td>68</td>
<td>125,346</td>
<td>.47</td>
</tr>
<tr>
<td>Sale - Book Value</td>
<td>70,781</td>
<td>68</td>
<td>323,880</td>
<td>1.80</td>
</tr>
<tr>
<td>Appraisal/Sale</td>
<td>97.69</td>
<td>68</td>
<td>13.57</td>
<td>---</td>
</tr>
<tr>
<td>Book/Sale</td>
<td>98.72</td>
<td>68</td>
<td>28.58</td>
<td>---</td>
</tr>
<tr>
<td>DAPSALE(^a)</td>
<td>-2.29</td>
<td>63(^c)</td>
<td>13.16</td>
<td>-1.38</td>
</tr>
<tr>
<td>DBKSALE(^b)</td>
<td>-1.63</td>
<td>63</td>
<td>29.63</td>
<td>-.44</td>
</tr>
</tbody>
</table>

\(^a\) Individual appraisal as a percentage of individual sale value minus 100 percent.

\(^b\) Individual book value as a percentage of individual sale value minus 100 percent.

\(^c\) n=63 because the undefined regional items were omitted.

Between pairs of appraisals and selling prices was one-tenth of the mean difference between pairs of book values and selling prices, with almost one-third of the deviation of book values to actual selling prices.

The characteristics of sample year 1972 demonstrated that appraisal value is as objective and reliable as book value, if not more so.

The characteristics of sample year 1975 are presented in Table 12. The means of selling prices, appraisal values, and book values were close. The deviation around the mean of all pairs of appraisals and actual selling prices was $56,013. The deviation around the mean of all
TABLE 12
CHARACTERISTICS OF SAMPLE YEAR 1975

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>n</th>
<th>Standard Deviation</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sale Price</td>
<td>194,295</td>
<td>74</td>
<td>261,955</td>
<td>---</td>
</tr>
<tr>
<td>Appraisal Value</td>
<td>198,696</td>
<td>74</td>
<td>283,684</td>
<td>---</td>
</tr>
<tr>
<td>Book Value</td>
<td>195,512</td>
<td>74</td>
<td>249,744</td>
<td>---</td>
</tr>
<tr>
<td>Sale - Appraisal</td>
<td>-4,401</td>
<td>74</td>
<td>56,013</td>
<td>-0.68</td>
</tr>
<tr>
<td>Sale - Book Value</td>
<td>-1,217</td>
<td>74</td>
<td>95,007</td>
<td>-0.11</td>
</tr>
<tr>
<td>Appraisal/Sale</td>
<td>104.32</td>
<td>74</td>
<td>20.25</td>
<td>---</td>
</tr>
<tr>
<td>Book/Sale</td>
<td>109.07</td>
<td>74</td>
<td>35.66</td>
<td>---</td>
</tr>
<tr>
<td>DAPSALE&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.88</td>
<td>68c</td>
<td>20.68</td>
<td>1.55</td>
</tr>
<tr>
<td>DBKSALE&lt;sup&gt;b&lt;/sup&gt;</td>
<td>7.60</td>
<td>68</td>
<td>36.63</td>
<td>1.71</td>
</tr>
</tbody>
</table>

<sup>a</sup>Individual appraisal as a percentage of individual sale value minus 100 percent.

<sup>b</sup>Individual book value as a percentage of individual sale value minus 100 percent.

<sup>c</sup>n=68 because the undefined regional items were omitted.

Pairs of book values and actual selling prices was $95,007.

An analysis of the results of sample year 1975 revealed that although almost equal degrees of objectivity existed between appraisals and book values, appraisal methods are more reliable than those methods using book values.

The mean scores for the selling price were $281,185 in 1972 and $194,295 in 1975; for the appraisal value, the scores were $274,027 in 1972 and $198,696 in 1975. The means for the book value were $210,404 in 1972 and $195,512 in 1975. The average value of appraisal to
selling price, based on an item-by-item analysis, was 97.69 percent in 1972 and 104.32 percent in 1975. The average book value to selling price, based on an item-by-item comparison, was 98.72 percent in 1972 and 109.07 percent in 1975.

The standard deviation of appraisals to selling values was 13.57 percent in 1972 and 20.25 percent in 1975. However, the standard deviation of book values to selling values was 28.58 percent in 1972 and 35.66 percent in 1975. The results of analysis demonstrated that, under the differing economic conditions of 1972 and 1975, the deviation about the mean scores was significantly less for appraisals than for book values. Therefore, appraisal values were as objective as book values, if not more so.

Hypotheses Testing

An hypothesis must be presented in a form that can be tested. "The null and alternative hypotheses are opposites, so that when one is true the other may be presumed false." In this chapter, general null hypotheses of no difference were tested. A null hypothesis was rejected or accepted at an .05 statistical significance level.

The hypotheses below are first stated in null form, followed by alternative forms.

---

Difference Between Appraisal Values and Actual Selling Prices

This hypothesis investigates whether there is a significant difference between appraisals made by independent appraisers and actual selling prices (values).

\[ H_0: \text{There is no difference between the independent appraisal values and the actual selling prices (values) of industrial and commercial real estate properties.} \]

\[ H_1: \text{There is a difference between the independent appraisal values and the actual selling prices (values) of industrial and commercial real estate properties.} \]

To test the differences between appraisal and selling values, the following hypotheses were stated:

\[ H_0: \bar{D}_1 = 0 \]

\[ H_1: \bar{D}_1 \neq 0 \]

where: \( \bar{D}_1 \) = mean of the differences between pairs of appraisals and actual selling prices.

The results of the student t-test being used (presented in Tables 11 and 12) found that there was no significant difference at the .05 level between appraisal values and actual selling prices (values). Therefore, the null hypothesis was accepted. This acceptance was significantly demonstrated in all cases:

1. differences of appraisal and selling values in absolute amounts in 1972;
(2) differences of appraisal and selling values in absolute amounts in 1975;
(3) differences of appraisal and selling values in percentages in 1972; and
(4) differences of appraisal and selling values in percentages in 1975.

The fact that there is no difference between appraisal values and actual selling values has been supported by the acceptance of the null hypothesis, as well as by the perception process findings.

**Difference Between Book Values and Selling Prices**

Had any difference occurred between book values and selling values, it would have been determined by the following hypothesis. Results then could be compared with those results of previous hypotheses.

- **H₀**: There is no difference between the book values and the actual selling prices (values) of industrial and commercial real estate properties.
- **H₁**: There is a difference between the book values and the actual selling prices (values) of industrial and commercial real estate properties.

Differences in book values and actual selling values could be tested according to the following:

- **H₀**: \( \overline{D}_2 = 0 \)
- **H₁**: \( \overline{D}_2 \neq 0 \)

where: \( \overline{D}_2 \) = the mean of the differences between pairs of book values and actual selling prices.
The difference was not significant at the .05 level and the null hypothesis was accepted. However, the probability of its being greater than t was .076 when absolute amounts of differences between book values and selling values in 1972 were used and .0916 when amounts of differences in 1975 were stated as percentages. This difference does approach a significant level. The t-values are shown in Tables 11 and 12.

**Appraisals Under Different Economic Conditions**

The hypotheses below mainly tested the differences in reliability of appraisals that were made in 1972 as opposed to those made in 1975. Compared with the inflation ratio of 1972, that of 1975 was high.

\[ H_0: \ \text{There is no difference between the deviation of appraisal values to selling values made in different periods for industrial and commercial real estate properties.} \]

\[ H_1: \ \text{There is a difference between the deviation of appraisal values to selling values made in different periods for industrial and commercial real estate properties.} \]

To test the reliability of appraisals under different economic conditions, these hypotheses were stated:

\[ H_0: \ A_{1972} = A_{1975} \]

\[ H_1: \ A_{1972} \neq A_{1975} \]

where: \[ A_{1972} = \text{the deviation between appraisal values and selling values in 1972; and} \]
$A_{1975}$ = the deviation between appraisal values and selling values in 1975.

Analysis of variance techniques were used to test the acceptance or rejection of the hypotheses. As different years and regions (across the classes) were utilized, pieces of property having no region identification were eliminated. Therefore, $n = 63$ in 1972 and $n = 68$ in 1975.

The results of the statistical tests did not show any significant difference at the .05 level. Deviation of appraisal values to selling values in 1972 was no different from that of 1975 (either in absolute amounts or in percentages). The difference was not significant, and the null hypothesis was accepted.

**Appraisals in Different Geographical Regions**

Since inflation rates may differ by region, it might seem that the appraisal process would vary according to geographical region. However, in most instances, this process is performed by independent professional appraisers who usually assess climates of different regions. The hypothesis below was stated in order to test whether there is a difference in appraisals among different geographical areas.

$H_0$: There is no difference in the deviation of appraisal values between different geographical areas.
$H_1$: There is a difference in the deviation of appraisal values between different geographical areas.

These hypotheses are stated as follows:

$H_0$: $R_1 = R_2 = \ldots = R_5$

$H_1$: $R_1 \neq R_2 \neq \ldots \neq R_5$

where: $R = \text{the deviation between appraisal values and selling values in region } i: i = 1, 2, \ldots, 5.$

Deviations were calculated in absolute and percentage amounts. Again, $n = 63$ in 1972 and $n = 68$ in 1975. The difference in deviation between appraisal values and book values was not found to be significant whether in absolute or percentage deviations (at the .05 level of significance). Therefore, the null hypothesis was accepted.

The existence of substantial differences in appraisal values according to different geographic areas was a controversial issue. Thirty percent of the total respondents agreed that substantial differences in appraisal values according to different geographical areas did exist, as opposed to 23 percent who did not.

**Summary**

A perception of the appraisal process will better facilitate communication of the accounting discipline. The responses of the top financial executive group were presented and analyzed in this chapter.
An analysis of perception results revealed strong support of appraisal values as being reasonably close to selling prices, substantially different between independent appraisers, more useful in the decision-making process than book values, reasonably reliable estimates of current market values, and the best available estimates of current values for real estate-type assets.

The statement that reliability of appraisal values will differ substantially from one geographical region to another was not supported by a sample majority.

A study of the characteristics of the sample and a test of the hypotheses revealed that appraisal values are as objective as historical values. In general, appraisals about the mean scored less deviation than those about the mean book value. Hypotheses findings supported the supposition that there is no difference between appraisal values and selling values of real estate properties. A similar finding supported no difference between book values and selling values even though a level of significance was approached.

In a comparison of the reliability of appraisals to selling values for 1972 and 1975 and between different regions, there was no significant difference. The year or region, therefore, in which the appraisal process was conducted had no effect on the reliability of such estimates. The appraiser did not seem to be affected by
regional climate and he evaluated and assessed properties in a milieu of changing economic conditions, such as those existing in 1972 and 1975.
CHAPTER VI

DISCLOSURE OF PREDICTION MODELS

In decision making, the user of financial statements evaluates available data and assesses the prospects of attaining his goals in light of alternative measurements. Predictive information facilitates his decision making power. An attempt was made to develop general predictive models.

The purpose of this chapter is to determine if there is a significant difference in the predictive ability of financial statements prepared on an historical basis as compared with those statements prepared on a current value basis using appraisal techniques.

General prediction models were established by using different statistical methods such as correlation and regression techniques. The results of a comparison analysis between the prediction models are revealed in this chapter.

The computer system at McMurry College was used. Multiple linear regression techniques were utilized to determine: correlation coefficients, regression coefficients, standard errors of regression coefficients,
t-values, intercept, multiple correlation coefficients, standard error of estimate, and analysis of variance for the multiple regression. Simple or bivariate and multiple regressions were performed through multiple linear regression at the same time.¹

Correlation Analysis and Measuring Relationships

Correlation methods measure the relationships that might exist between variables and assist in predicting those variables. Schmidt stated:

There are probably many good ways to describe the goals of science. One might be to say that science attempts to discover relations among natural phenomena; to describe relations, to predict them. . . . Correlation methods give us a means of describing and measuring relations even in situations where the relations are difficult to see.²

Correlation methods aid predictability by revealing information concerning the direction and degree of association between variables. Direction is usually indicated by a positive or negative relationship. A positive relationship occurs when a high value of one variable tends to be accompanied by a high value of


another variable. Negative relationships exist when one variable decreases and another variable increases. The relationship is indicated by certain signs (+ or -). The degree of association could be any value between 1 and 0. Perfect association is the highest degree of relation; zero is the lowest.

The r (correlation coefficient) is used to measure the direction and degree of relationship between variables. The sign r is the indication of direction. Correlation coefficient r also has an upper limit of absolute 1 and a lower limit of absolute 0 to measure the degree of association. "Of course r cannot take on a value greater than 1 or less than -1."\(^3\)

An analysis of correlation methods revealed that there was always a positive relationship between selling, appraisal, and book values. A high selling value was accompanied by a high appraisal or book value. It was found that the degree of association was high between these variables. Table 13 illustrates the difference in degree of association which existed between variables.

As shown in Table 13, the degrees of association between appraisal and selling values were higher than the degrees of association between book and selling values. (The only exception was Region 4.) Multiple correlation

### TABLE 13

DIFFERENCES IN DEGREE OF ASSOCIATION BETWEEN VARIABLES

<table>
<thead>
<tr>
<th></th>
<th>Appraisal with selling values (1)</th>
<th>Book with selling values (2)</th>
<th>Appraisal and book values with selling values (3)</th>
<th>Difference $a$ $1 - 2$</th>
<th>Difference $b$ $3 - 2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>All data, $n = 142$</td>
<td>96.94</td>
<td>79.44</td>
<td>97.17</td>
<td>17.50</td>
<td>17.73</td>
</tr>
<tr>
<td>1972, $n = 68$</td>
<td>97.06</td>
<td>78.33</td>
<td>97.33</td>
<td>18.73</td>
<td>19.00</td>
</tr>
<tr>
<td>1975, $n = 74$</td>
<td>99.89</td>
<td>99.66</td>
<td>99.90</td>
<td>.23</td>
<td>.24</td>
</tr>
<tr>
<td>Region 1, $n = 27$</td>
<td>99.57</td>
<td>94.87</td>
<td>99.70</td>
<td>4.70</td>
<td>4.83</td>
</tr>
<tr>
<td>Region 2, $n = 43$</td>
<td>96.97</td>
<td>72.84</td>
<td>97.21</td>
<td>24.13</td>
<td>24.37</td>
</tr>
<tr>
<td>Region 3, $n = 30$</td>
<td>96.65</td>
<td>89.07</td>
<td>97.64</td>
<td>7.58</td>
<td>8.57</td>
</tr>
<tr>
<td>Region 4, $n = 17$</td>
<td>91.43</td>
<td>96.47</td>
<td>99.02</td>
<td>-5.04</td>
<td>2.55</td>
</tr>
<tr>
<td>Region 5, $n = 14$</td>
<td>99.77</td>
<td>95.04</td>
<td>99.88</td>
<td>4.73</td>
<td>4.84</td>
</tr>
</tbody>
</table>

$^a$Degree of association ($r$) of appraisal value to selling value - Degree of association ($r$) of book value to selling value.

$^b$Degree of association ($r$) between selling value and both appraisal and book value - Degree of association ($r$) of book value to selling value.
between selling value and the other variables (appraisal and book values) scored a high degree of association in all data.

Although a high degree of association could exist between two variables, there was no assurance of cause and effect between them. Predictions are still educated guesses. A prediction based on an informed opinion is better than that made without any information at all.

Bivariate Regression Models

In many situations, a straight-line relationship can be valuable in summarizing the effects of one observed variable on another. A straight line can be obtained by using the method of least squares. "It will be accepted as the best linear equation available to describe the relation between X and Y." This is because the regression line is usually obtained by minimizing the squared deviations about the regression line.

Bivariate regression models can be described by the following linear notation:

---

4 Schmidt, op. cit., p. 162.


6 Schmidt, op. cit., p. 166.
\[ Y = a + b_1 X + e \]

where:  
- \( Y \) denotes the value of the dependent variable;  
- \( X \) indicates the value of the independent variable;  
- \( a \) and \( b_1 \) are the parameters of the model; \( ^7 \) and  
- \( e \) denotes a residual.  

Given a pair of observations (\( Y \) and \( X \)), the least squares method allows us to determine the estimates of the parameters. Therefore, the previous equation will be used as the predictive equation:

\[ \hat{Y} = a + b_1 X \]

where: \( \hat{Y} \), read \( Y \) hat, indicates the predicted value of \( Y \) for a given \( X \), when \( a \) and \( b_1 \) are determined. \( ^8 \)  

The value of \( a \) is called the intercept where the line crosses the vertical axis. The value of \( b_1 \) is called the slope of the line. This is illustrated in Figure 1.  

The regression models presented here consider the determinants of selling values. The selling value (\( Y \)) of industrial and commercial real estate properties is treated as a dependent variable (Dependent No. 1). The independent variables are described below:

---

\( ^7 \) Draper and Smith, op. cit., p. 8.  
\( ^8 \) Ibid., p. 9.
FIGURE 1
LINEAR REGRESSION

\[ Y = a + b_1X \]

\[ b_1 \]

\[ a \]

\[ X \]

\[ Y \]

\( X_1 \): Appraisal values of industrial and commercial real estate properties (Variable 2). A linear relationship between appraisal values and selling values is depicted. Thus, knowing the appraisal value is assumed to assist in predicting the dependent variable (Y). A piece of property was qualified if it was sold and appraised during the same year. No time gap was allowed.

\( X_2 \): Book values of industrial and commercial real estate properties (Variable 3). The relationship between this variable and the dependent variable was considered to be a straight-line or predicted one.

As a bivariate relationship, regression was made each time between Y and \( X_1 \) or Y and \( X_2 \). In other words, \( X_1 \) or \( X_2 \) is a substitute of X in the equation \( Y = a + b_1X \). Regression between Y and both \( X_1 \) and \( X_2 \) will be discussed in the multiple regression section.

A summary of the results of the bivariate regression of the dependent variable on each of the independent variables is presented in Tables 14 and 15.
Simple prediction models, or bivariate regression models, for all data, years, and regions are presented in Table 14. The parameters $a$ and $b_1$ as constants were determined. Once these constants were specified, the equation determined $\hat{Y}$ for every $X_1$ or $X_2$. The slope of the line had a range of .82 to 1.12 and for all data was .99. This range represented the change of selling value when a change of one unit of appraisal value occurred, i.e., a $.99 change in selling price for each dollar change of appraisal value. The slope of the selling value to book value ranged between .81 and 1.49 and all data was 1.04.

It was necessary to distinguish between $r$ value and $b_1$ value. Draper and Smith pointed out: "The correlation of $r_{xy}$ measures association between $X$ and $Y$, while $b_1$ measures the size of the change in $Y$, which can be predicted when a unit change is made in $X$."\(^9\)

Therefore, the interpretation of $r$ value as a measurement of the degree of association was different from the interpretation of $b_1$ value as a measurement of the size of change.

\(^9\)Ibid., p. 35.
TABLE 14
BIVARIATE REGRESSION MODELS

<table>
<thead>
<tr>
<th></th>
<th>Y = a + bX</th>
<th>a</th>
<th>b₁</th>
<th>s.e.(b₁)</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>All data</td>
<td>3,926</td>
<td>.99</td>
<td>.021</td>
<td>46.70</td>
<td></td>
</tr>
<tr>
<td>n = 142</td>
<td>24,842</td>
<td>1.04</td>
<td>.067</td>
<td>15.48</td>
<td></td>
</tr>
<tr>
<td>1972</td>
<td>2,452</td>
<td>1.02</td>
<td>.031</td>
<td>32.77</td>
<td></td>
</tr>
<tr>
<td>n = 68</td>
<td>59,285</td>
<td>1.05</td>
<td>.103</td>
<td>10.24</td>
<td></td>
</tr>
<tr>
<td>1975</td>
<td>1.768</td>
<td>1.02</td>
<td>.006</td>
<td>184.37</td>
<td></td>
</tr>
<tr>
<td>n = 74</td>
<td>60,310</td>
<td>.81</td>
<td>.007</td>
<td>103.19</td>
<td></td>
</tr>
<tr>
<td>Region 1</td>
<td>31,022</td>
<td>.82</td>
<td>.015</td>
<td>53.74</td>
<td></td>
</tr>
<tr>
<td>n = 27</td>
<td>-45,665</td>
<td>1.49</td>
<td>.099</td>
<td>15.03</td>
<td></td>
</tr>
<tr>
<td>Region 2</td>
<td>-12,795</td>
<td>1.07</td>
<td>.042</td>
<td>25.40</td>
<td></td>
</tr>
<tr>
<td>n = 43</td>
<td>98,411</td>
<td>.96</td>
<td>.141</td>
<td>6.81</td>
<td></td>
</tr>
<tr>
<td>Region 3</td>
<td>-2,542</td>
<td>1.02</td>
<td>.051</td>
<td>19.93</td>
<td></td>
</tr>
<tr>
<td>n = 30</td>
<td>13,684</td>
<td>.91</td>
<td>.088</td>
<td>10.37</td>
<td></td>
</tr>
<tr>
<td>Region 4</td>
<td>881</td>
<td>1.12</td>
<td>.128</td>
<td>8.74</td>
<td></td>
</tr>
<tr>
<td>n = 17</td>
<td>-22,355</td>
<td>1.29</td>
<td>.091</td>
<td>14.18</td>
<td></td>
</tr>
<tr>
<td>Region 5</td>
<td>4,141</td>
<td>.95</td>
<td>.019</td>
<td>50.77</td>
<td></td>
</tr>
<tr>
<td>n = 14</td>
<td>6,793</td>
<td>.90</td>
<td>.085</td>
<td>10.59</td>
<td></td>
</tr>
</tbody>
</table>

aRepresents the regression between Y and X₁ (X₁ = appraisal values).

bRepresents the regression between Y and X₂ (X₂ = book values).

Precision of Estimates

Precision in estimation as a standard deviation of obtained values around the regression line was indicated by standard error of estimate (s.e.).¹⁰ It represented a

¹⁰Schmidt, op. cit., p. 169.
measure of the spread or scatter about the estimated regression line. "Estimates made from the regression line will be more precise the less scattered the data."\(^{11}\) This measure suggested its possible use as an estimate of the true variability in \(Y\) and may express the degree of scatter in the data.

An examination of Table 14 revealed that the value of s.e. of the estimate of regression coefficient was constantly smaller in appraisal models than in book models. This was true for all data, 1972, 1975, and all regions except Region 4. As opposed to book value models, the value of the student t-test was greater in almost all appraisal models. This meant that the degree of variability, or the degree of scatter about the regression line, was less in appraisal value models. Therefore, estimates made from appraisal models were more precise than those made from book value models. However, the range of s.e. value was between .006 and .128 in appraisals as compared with .007 and .141 in book value models. For all pieces of property, s.e. of estimate was .021 \((t = 46.70)\) in appraisals as compared with .067 \((t = 15.48)\) in other estimates.


\(^{12}\)Ibid., p. 461.
Variations Explained by Regression

Variations explained by the regression line are usually measured by the coefficient of determination ($R^2$). This measures the proportion of the total variation in $Y$ explained by the regression line. Computer print-outs usually provide the $R^2$ and $F$-test value. The $F$-test is a test of the significance of regression. Thus, $R^2$ and $F$-value are valuable in explaining variations and significance due to regression line. $R^2$ is related to correlation coefficient ($r$) and is an aid in the interpretation of $r$ ($R^2 = r \times r$). Table 15 describes the values of $R^2$ and the $F$-tests with associated degrees of freedom.

The $F$-tests emphasized the existence of regression in all data, years, and regions with an .05 significance level. However, except for Region 4, the values of $F$ were greater in appraisal regressions than book value regressions.

For all pieces of industrial and commercial properties appraised in this study, the regression equation or model obtained explained 93.97 percent of the total variation in selling values ($Y$). Regression based on book

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13Ibid., p. 483.
TABLE 15
VARIATIONS EXPLAINED BY BIVARIATE REGRESSION

<table>
<thead>
<tr>
<th></th>
<th>$R^2$</th>
<th>F</th>
<th>d.f.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All data</strong></td>
<td>93.97$^a$</td>
<td>63.11$^b$</td>
<td>2,181 (1,140)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>239</td>
<td>(1,140)</td>
</tr>
<tr>
<td>1972</td>
<td>94.21</td>
<td>1,074</td>
<td>(1,66)</td>
</tr>
<tr>
<td></td>
<td>91.35</td>
<td>105</td>
<td>(1,66)</td>
</tr>
<tr>
<td>1975</td>
<td>99.78</td>
<td>33,994</td>
<td>(1,72)</td>
</tr>
<tr>
<td></td>
<td>99.33</td>
<td>10,647</td>
<td>(1,72)</td>
</tr>
<tr>
<td>Region 1</td>
<td>99.14</td>
<td>2,888</td>
<td>(1,25)</td>
</tr>
<tr>
<td></td>
<td>90.03</td>
<td>225</td>
<td>(1,25)</td>
</tr>
<tr>
<td>Region 2</td>
<td>94.03</td>
<td>645</td>
<td>(1,41)</td>
</tr>
<tr>
<td></td>
<td>53.06</td>
<td>46</td>
<td>(1,41)</td>
</tr>
<tr>
<td>Region 3</td>
<td>93.41</td>
<td>397</td>
<td>(1,28)</td>
</tr>
<tr>
<td></td>
<td>79.33</td>
<td>108</td>
<td>(1,28)</td>
</tr>
<tr>
<td>Region 4</td>
<td>83.59</td>
<td>76</td>
<td>(1,15)</td>
</tr>
<tr>
<td></td>
<td>93.06</td>
<td>201</td>
<td>(1,15)</td>
</tr>
<tr>
<td>Region 5</td>
<td>99.54</td>
<td>2,577</td>
<td>(1,12)</td>
</tr>
<tr>
<td></td>
<td>90.33</td>
<td>112</td>
<td>(1,12)</td>
</tr>
</tbody>
</table>

$^a$Represents the regression between $Y$ and $X_1$ ($X_1 =$ appraisal values).

$^b$Represents the regression between $Y$ and $X_2$ ($X_2 =$ book values).

values for these properties explained only 63.11 percent of the variation.

The range of explained variation was between 99.78 percent and 83.59 percent among simple appraisal models of prediction. Simple book value models had a range of 53.06 percent to 99.33 percent. As a result,
the percentage of variation in selling prices (Y) accounted for by variation in appraisal values was constantly higher than those accounted for by variation in book values, except in Region 4. Therefore, appraisal models almost consistently explained more of the variation in dependent variables than did book value models.

**Multiple Regression Models**

In many cases, it was necessary to consider more than two variables. Knowledge of more than one independent variable was needed to obtain a better prediction of a particular response.\(^{15}\) Regression techniques were expanded to include three variables. The total variation in selling value (Y) may be explained by both appraisal (\(X_1\)) and book values (\(X_2\)). The multiple regression model is:

\[
Y = a + b_1 X_1 + b_2 X_2.
\]

The regression equation corresponds to a plane which must be slanted in such a way as to provide the best fit.\(^{16}\) The constants \(a\), \(b_1\), and \(b_2\) have different interpretations here than in the simple or bivariate regression models. The constant \(a\) is the Y intercept where the regression plane cuts the Y axis.\(^{17}\) The constant \(b_1\)

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\(^{15}\)Ibid., p. 104.

\(^{16}\)Lapin, op. cit., p. 499.

\(^{17}\)Ibid., p. 500.
represents the net change in selling value ($Y$) for a one-unit increase in appraisal value ($X_1$), holding the book value ($X_2$) fixed at a constant value. Similarly, $b_2$ is the net change in $X_2$, keeping $X_1$ fixed. This is illustrated in Figure 2.

**FIGURE 2**

MULTIPLE REGRESSION PLANE

$Y$ (selling value)

$X_1$ (appraisals)

$X_2$ (book values)

Multiple regression models\(^{18}\) are presented in Table 16. Parameters of these models were determined to fit specific years or regions. In general, the all-data model could be presented in the following equation:

$$Y = -4550 + .90(X_1) + .14(X_2).$$

\(^{18}\)Draper and Smith, *op. cit.*, pp. 104-27.
TABLE 16  
MULTIPLE REGRESSION MODELS

\[ Y = a + b_1 X_1 + b_2 X_2 \]

<table>
<thead>
<tr>
<th></th>
<th>( a )</th>
<th>( b_1 )</th>
<th>( b_2 )</th>
<th>( s.e. )</th>
<th>( t )</th>
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</thead>
<tbody>
<tr>
<td>All data</td>
<td>-4,550</td>
<td>0.90</td>
<td>0.14</td>
<td>0.032</td>
<td>27.91</td>
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<tr>
<td>( n = 142 )</td>
<td></td>
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<tr>
<td>1972</td>
<td>-6,097</td>
<td>0.93</td>
<td>0.15</td>
<td>0.046</td>
<td>20.30</td>
</tr>
<tr>
<td>( n = 68 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1975</td>
<td>-11,230</td>
<td>1.26</td>
<td>-0.19</td>
<td>0.096</td>
<td>13.05</td>
</tr>
<tr>
<td>( n = 74 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Region 1</td>
<td>15,994</td>
<td>0.71</td>
<td>0.22</td>
<td>0.037</td>
<td>19.35</td>
</tr>
<tr>
<td>( n = 27 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Region 2</td>
<td>-20,911</td>
<td>1.00</td>
<td>0.13</td>
<td>0.057</td>
<td>17.37</td>
</tr>
<tr>
<td>( n = 43 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Region 3</td>
<td>1,584</td>
<td>1.53</td>
<td>-0.51</td>
<td>0.159</td>
<td>9.61</td>
</tr>
<tr>
<td>( n = 30 )</td>
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<tr>
<td>Region 4</td>
<td>-25,124</td>
<td>0.47</td>
<td>0.87</td>
<td>0.078</td>
<td>6.00</td>
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<td>( n = 17 )</td>
<td></td>
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<td></td>
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<tr>
<td>Region 5</td>
<td>1,796</td>
<td>0.83</td>
<td>0.13</td>
<td>0.040</td>
<td>20.93</td>
</tr>
<tr>
<td>( n = 14 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thus, an asset or piece of property that has an appraiser value of $90,000 and a book value of $100,000 would have a predicted selling value of \( Y = -4550 + .90(90,000) + .14(100,000) = 90,450 \).

Toward More Precise Predictions

Is any improvement introduced by adding one more independent variable to the bivariate models? The \( R^2 \) value that explains the variation in data might answer
this question. The larger $R^2$, the better fitted the
equation. In an attempt to show that the accuracy of
prediction was improved after another variable was intro­
duced, Lapin concluded: "Multiple regression will provide
predictions that are more precise than those obtained by
simple regression."\(^{19}\)

The differences in $R^2$ values are shown in Table 17. The results signified that multiple regression models
were superior to bivariate regression models even though
the degree of freedom was slightly reduced. Still,
unexplained variation would be reduced if more variables
such as the location and usage of properties, and so forth
are to be added to these models. Such an addition was not
included in the scope of this study.

An examination of the results of Tables 13 and 15
led us to conclude that:

(1) bivariate prediction models based on
appraisal values, in most cases, were superior
to those models based on book values in
explaining variations in selling values; and

(2) multiple regression models which used both
appraisal and book values as independent
variables were superior to bivariate pre­
diction models which included either appraisal
or book values as independent variables.

\(^{19}\)Lapin, op. cit., p. 508.
Table 17

Reduction in Unexplained Variation (in percents)

<table>
<thead>
<tr>
<th></th>
<th>Difference in $R^2_a$</th>
<th>Difference in $R^2_b$</th>
</tr>
</thead>
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<td>0.44</td>
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<td>1972</td>
<td>0.53</td>
<td>33.39</td>
</tr>
<tr>
<td>1975</td>
<td>0.02</td>
<td>0.47</td>
</tr>
<tr>
<td>Region 1</td>
<td>0.26</td>
<td>9.37</td>
</tr>
<tr>
<td>Region 2</td>
<td>0.47</td>
<td>41.44</td>
</tr>
<tr>
<td>Region 3</td>
<td>2.12</td>
<td>16.20</td>
</tr>
<tr>
<td>Region 4</td>
<td>15.21</td>
<td>5.74</td>
</tr>
<tr>
<td>Region 5</td>
<td>0.22</td>
<td>9.43</td>
</tr>
</tbody>
</table>

$R^2_a$ value according to multiple regression model - $R^2$ value based on bivariate regression model (selling value vs. appraisal value).

$R^2_b$ value according to multiple regression model - $R^2$ value based on bivariate regression model (selling value vs. book value).

A reduction in the unexplained variations in selling value was reduced when multiple regression models were introduced. An unexplained variation by bivariate models based on selling and book values was reduced more than those models based on selling and appraisal values. The range of reduction was between 0.47-41.44 percent, as compared with 0.02-15.21 percent.
In conclusion, financial statements that disclose only current value accounting might be better than those that disclose historical value accounting. In addition, the publishing of financial statements which disclose conventional data and current data has merit.

**Summary**

Various statistical techniques were used to either measure relationships (association) or develop different prediction models.

Correlation methods were used to describe and measure relationships between different variables. The actual selling price of industrial and commercial real estate properties was treated as a dependent variable. Appraisal and/or book values were considered as independent variables. Relations or associations between actual selling prices, appraisal values, and/or book values were thereby measured.

Simple regression models such as bivariate regression models were utilized in disclosing prediction models. The appraisal models were those which used appraisal values as an independent variable. Book value models were those which used book values as independent variables. Different models were generated when data were broken down according to year or region.

More prediction models using multiple regression techniques were recorded. It was assumed that the actual
selling price could be more precisely predicted by knowing the book and appraisal values of a property.

Finally, a comparison was made between the different models, with the results of the analysis revealing a superiority of some models over others.
CHAPTER VII

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary and Conclusions

The SEC's requirement of current value disclosures has created the need for a reliable method of asset valuation. A reliable estimate of current asset value is needed even more when there are no current market prices available. Industrial and commercial real estate properties illustrate this point. For such unique-type assets, appraisal methods could provide current value estimates.

In theoretical investigation, there is a controversy concerning what concept or basis of asset valuation should be accepted in the presentation of financial statements. The preference could be for historical, general purchasing power, or current value.

The historical or conventional concept of asset valuation is the dominant one in accounting practice, with limited exceptions. In the last two decades, the tendency has been to repeatedly stress opposition to historical value. This is mainly because the historical method of
valuation has failed to reflect changes in general or specific prices of commodities. Moreover, more useful information could be provided by financial statements based on other concepts of asset valuation. Therefore, accountants are at the crossroads, wondering which direction to take.

This controversial issue could be solved on the grounds of what objectives financial reporting tries to achieve. Evidence from the literature revealed that those statements should provide reliable information useful either in making economic decisions or in predicting future events by those who mainly depend on these reports. Supporters of each asset valuation basis claim its usefulness which satisfies the major objective of financial statements.

Current value as a means of asset valuation has been increasingly supported by accountants because of its various advantages over other valuation concepts. Financial statements based on current value data were suggested as either a supplement to the conventional data or as a separate set of financial statements.

Asset valuation theory and measurement appeared to be twins in theoretical investigation. Valuation was usually used as a substitute for the process of asset measurement. The preference basis was one of the more prominent controversies. Preferences could be, as
mentioned above, on an historical, general purchasing power, or current basis. Measurement procedures could, thereby, generate different values. Consequently, measurement processes need a criterion as a guide to achieve accurate and reliable results.

The second part of theoretical investigation set forth a criterion for evaluation and discussed measurement constraints. In addition to the lack of criterion for evaluation, the uncertainty, conservatism, and unstable monetary unit served as constraints.

Objectivity could be one such criterion. Objectivity is a matter of degree determined by the degree of verifiability and freedom from bias of such measurement. The less dispersion of measurement values around the mean or an average figure, the more objective it is considered to be. Bias is measured by how close the mean of $\bar{X}$ is to the true or desirable value of $X$. A reliable measurement procedure is one which results in a value close to what is supposed to be. Reliability and objectivity are, therefore, closely related.

Predictability could be another criterion. A decision cannot be made without a kind of prediction which is necessary to users of financial statements. Thus, the criterion of predictability could assist in selecting between competing alternatives of valuation. The greater
the predictability the alternative provides, the stronger it will be considered as the selection to be provided to users.

Usefulness is one criterion that has many supporting references in accounting literature. Some writers are even willing to sacrifice a degree of objectivity for more usefulness. Accountants' views revealed theoretical evidence of objectivity, predictability, and usefulness of accounting based on current market value.

The third part of theoretical investigation reviewed the related empirical studies that either used a similar criterion or that involved an investigation into the same subject matter as this study.

It was found that there were few studies conducted in the area of current value accounting. Research in this subject area focused on determining the desirability, usefulness, objectivity, and so forth of current value accounting. Some findings of these studies pointed out:

(1) current financial reports are deficient since they do not present current values for assets;

(2) the use of current value results in less diversity of measurement than under current practice where market data are available;
(3) a majority within banker and financial analyst groups disagreed with a current value concept of earnings per share. Stockholders were indifferent;

(4) the majority of users desired current information in a supplemental form;

(5) historical value is not verifiable, and current value is probably no worse with regard to those characteristics;

(6) current market values are more objective than historical values in the case of access to well-established market value indicators; and

(7) current replacement accounting is needed and should be encouraged by the AICPA.

Investigation revealed that only one study tried to evaluate the relative objectivity of appraisals as a method of current value accounting. Differences exist between the writer's study and the previous study mainly because of nationwide, geographic, economic, types of real estate, and objectives of the research considerations. Furthermore, current values of assets have never been subject to evaluation through the predictive ability criterion.

The first objective of the empirical part of the study was to gather evidence of how management of large
corporations perceived appraisal methods. Management was represented by top financial executives of large corporations in the United States. A questionnaire was formulated and mailed to a random sample of 250 corporations selected from Fortune 500. Controllers or financial vice-presidents of those companies were the recipients of the questionnaires. The first part of the questionnaire was aimed at determining the respondents' perceptions of appraisal values as a reliable estimate of current market value.

Usable responses were received from 57 of the 250 officers. Therefore, the response rate in this part was 23 percent. Responses were analyzed according to a scale of: strongly agree, agree, neutral, disagree, or strongly disagree.

Two-thirds of the respondents agreed that the appraisal value of commercial and industrial real estate properties would be reasonably close to the selling price. Of the respondents, 49 percent believed there were significant or substantial differences between appraisers. Three out of four respondents supported the supposition that appraisal value is more useful than book value in decision making. Thirty percent believed that the reliability of appraisals would differ from one region to another; the proportion disagreeing was 23 percent. Almost 70 percent of the respondents felt that appraisal
value is a reasonably reliable estimate of current value. Seventy-seven percent of the respondents believed that appraisal value is the best available estimate of current value for a unique-type asset.

The second empirical objective of the study was to provide data to test the reliability of appraisal methods in estimating current market value. Appraisal reliability was compared with that of book value through hypotheses set up for that purpose. The second part of the questionnaire was aimed at gathering data from the records of those corporations contacted. Information requested concerned selling price, appraisal value, book value, year of appraisal, description, and year the appraisal was made.

Usable data on industrial and commercial real estate properties were received for 142 transactions. The significant differences in selling, appraisal, and book values were statistically analyzed in light of changing economic conditions and different geographic areas of the U.S. Analysis of variance was used for this purpose.

The standard deviation of differences between pairs of appraisal values and actual selling values was less than that of book values to selling values. Thus, appraisals were seen to have a higher degree of objectivity.
The hypotheses tested revealed that:

(1) there was no difference between appraisal value and actual selling value at the .05 level of significance. This acceptance was significantly demonstrated in all situations, i.e., differences of appraisal and selling values in absolute amounts in 1972 and in 1975, and differences in appraisal and selling values in percentages in 1972 and in 1975;

(2) there was no difference between book value and actual selling value at the .05 level of significance, but it did approach the significant level;

(3) there was no significant difference in deviation of appraisal value to selling value in 1972 as compared with that in 1975; and

(4) there was no significant difference in such deviation among the five regions of the U.S.

In other words, the evidence supported:

(1) no difference between appraisal and selling values;

(2) no difference between appraisal and selling values by geographic regions; and
independent appraisals seemed to assess changes in economic conditions, as evidenced by those different inflation conditions of 1972 and 1975.

The third empirical objective of this study was to develop general prediction models. Regression models were assumed to aid predictions. In addition, this study tested the models in order to determine which models were more powerful in explaining variations.

Correlation and regression techniques were used to reveal degrees of association between actual selling prices and either appraisal values, book values, or both. Simple or bivariate regression models were developed to fit all data in general, or years and regions specifically. Multiple regression models were also developed in this research.

The degrees of association between actual selling values and appraisal values were found to be constantly higher than those of actual selling and book values (years and regions). Simple regression (prediction) models that used appraisals were more successful in explaining variations in selling values than were those which used book values. Multiple regression (prediction) models that used both appraisal and book values were more successful in explaining variations than were simple prediction models. Therefore, multiple prediction models
were superior to simple prediction models. In conclusion, the disclosure of financial data through conventional as well as current value forms has merit.

**Recommendations for Additional Research**

The reliability of appraisals in determining current asset value is by nature an extremely broad topic. As a result, there is a need for more research in this area. A few suggestions are presented below.

This study was one group's perception of appraisals. Management represented by top financial executives was considered. Further research is needed to consider other groups that use financial statements, such as stockholders, financial analysts, creditors, and so forth. A survey of certified public accountants for their opinions would also give more depth to this subject.

There is a need for more research concerning the differences which exist between the reliability of appraisals conducted from inside an organization as opposed to those conducted from outside. Differences arise from different appraisal methods, as well as from appraisals made by different appraisers. Continuous research is needed to consider other sections of the economy, such as insurance and real estate companies.

Finally, the area of appraisals as a method of estimating current value is a relatively forgotten area
by accountants. It is not the end of the road, but rather an invitation and a challenge to their efforts and imaginations.
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Books


**Periodicals**


Harris, Edward C., and Laughler, O. Don. "Use of Appraisals in Condominium Accounting." Real Estate Review, 6 (Spring 1976), pp. 31-32.


"Reporting of Current Values." The Week in Review (October 4, 1974).


von Bruinessen, W. "Bases of Accounting Other Than Historical Cost." The Accountant, 167 (October 1972), pp. 484-86.


Miscellaneous


APPENDIX

REPRODUCTION OF COVER LETTER
AND QUESTIONNAIRE
Dear

Current developments emanating from the Securities and Exchange Commission relating to requirements for replacement cost accounting disclosures have stirred great interest in replacement cost measurement techniques. One of the possible methods for determining replacement costs is that of real estate appraisals.

As a doctoral student in accounting at Louisiana State University, I am writing a dissertation which relates to the reliability of independent real estate appraisals in estimating the market values under different economic conditions. In addition, this study is designed to help determine the perception of the reliability of appraisal methods.

The study requires a nationwide sample of commercial properties that have been sold in 1975 and 1972, and were appraised by independent appraisers prior to their sale. The results of this research would hopefully have far-reaching implications for financial reporting.

I have developed a very short questionnaire to gather the necessary information. Your responses will be held in complete confidence. No individual or firm names are requested. All responses will be summarized and used in statistical analyses. Will you please complete the enclosed questionnaire and return it in the envelope provided. An adequate response from the business community is necessary if this study is to be successful. Your cooperation will be most appreciated.

If you would like to receive a copy of the results of this study please fill in your name and address below and return this sheet to me. I sincerely hope that you will cooperate in this very timely and relevant research project.

Sincerely,

A. K. Zawati

Enclosure

Name ________________________________________________________________

Address ____________________________________________________________

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I- In the following six questions, indicate the answers, where:
SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly Disagree

(1) In most circumstances, the appraisal value of commercial and industrial real estate properties would be reasonably close to the selling price.

(2) Appraisals differ substantially between independent appraisers.

(3) The appraisal value is more useful in decision making than book value.

(4) The reliability of appraisal values will differ substantially from one geographic region to another.

(5) Appraisal value is a reasonably reliable estimate of current market value.

(6) For unique type assets, such as real estate, appraisal values represent the best available estimate of current value.

II- This is the essential part of this study. Please provide the requested data for five commercial or industrial real estate properties sold in 1975 and 1972. It is necessary that the properties were appraised by an outside appraiser prior to their sale. If possible, it would be appreciated if the ten sales could be selected on random basis. If all the information is not available, I would appreciate receiving whatever information you can give me.

-1975-

<table>
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<th>Book Value</th>
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<th>Property Description</th>
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-1972-

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</tbody>
</table>
Dear

I have sent you a letter asking your assistance and cooperation in my dissertation research project. If you have already responded, kindly accept this letter as a thank you note for your help. If you have not had time to answer, please complete the questionnaire and return it in the envelope provided. Every response counts in this project and can determine the success of this study. I sincerely depend on your willingness to cooperate. Won't you help me?

Sincerely yours,

A. K. Zawati

Enclosure
A.K. (AbdelKarim) Zawati
Amman, Jordan
February 8, 1942

B.S. in Commerce
Damascus University, 1964

M.S.
Syracuse University, 1971

Jordanian Government
1964-69, 1971-74

Graduate assistant
Louisiana State University
1975-76

Assistant Professor of
Accounting and Business
McMurry College
1976-77

Beta Alpha Psi National
Accounting Honor Society,
1975

American Accounting
Association

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EXAMINATION AND THESIS REPORT

Candidate: A. K. Zawati

Major Field: Accounting

Title of Thesis: The Reliability of Appraisal Methods in Determining Current Asset Value:
An Empirical Study

Approved:

[Signatures]

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

[Signatures]

Date of Examination:

July 19, 1977