

1982

## The Usefulness and Predictability of Net Realizable Values: an Empirical Study.

Jerry Joseph Baudin  
*Louisiana State University and Agricultural & Mechanical College*

Follow this and additional works at: [https://digitalcommons.lsu.edu/gradschool\\_disstheses](https://digitalcommons.lsu.edu/gradschool_disstheses)

---

### Recommended Citation

Baudin, Jerry Joseph, "The Usefulness and Predictability of Net Realizable Values: an Empirical Study." (1982). *LSU Historical Dissertations and Theses*. 3746.  
[https://digitalcommons.lsu.edu/gradschool\\_disstheses/3746](https://digitalcommons.lsu.edu/gradschool_disstheses/3746)

This Dissertation is brought to you for free and open access by the Graduate School at LSU Digital Commons. It has been accepted for inclusion in LSU Historical Dissertations and Theses by an authorized administrator of LSU Digital Commons. For more information, please contact [gradetd@lsu.edu](mailto:gradetd@lsu.edu).

## INFORMATION TO USERS

This reproduction was made from a copy of a document sent to us for microfilming. While the most advanced technology has been used to photograph and reproduce this document, the quality of the reproduction is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help clarify markings or notations which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure complete continuity.
2. When an image on the film is obliterated with a round black mark, it is an indication of either blurred copy because of movement during exposure, duplicate copy, or copyrighted materials that should not have been filmed. For blurred pages, a good image of the page can be found in the adjacent frame. If copyrighted materials were deleted, a target note will appear listing the pages in the adjacent frame.
3. When a map, drawing or chart, etc., is part of the material being photographed, a definite method of "sectioning" the material has been followed. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.
4. For illustrations that cannot be satisfactorily reproduced by xerographic means, photographic prints can be purchased at additional cost and inserted into your xerographic copy. These prints are available upon request from the Dissertations Customer Services Department.
5. Some pages in any document may have indistinct print. In all cases the best available copy has been filmed.

**University  
Microfilms  
International**

300 N. Zeeb Road  
Ann Arbor, MI 48106

8229489

**Baudin, Jerry Joseph**

**THE USEFULNESS AND PREDICTABILITY OF NET REALIZABLE  
VALUES: AN EMPIRICAL STUDY**

*The Louisiana State University and Agricultural and Mechanical Col.*    **PH.D. 1982**

**University  
Microfilms  
International** 300 N. Zeeb Road, Ann Arbor, MI 48106

**PLEASE NOTE:**

In all cases this material has been filmed in the best possible way from the available copy. Problems encountered with this document have been identified here with a check mark .

1. Glossy photographs or pages \_\_\_\_\_
2. Colored illustrations, paper or print \_\_\_\_\_
3. Photographs with dark background \_\_\_\_\_
4. Illustrations are poor copy \_\_\_\_\_
5. Pages with black marks, not original copy \_\_\_\_\_
6. Print shows through as there is text on both sides of page \_\_\_\_\_
7. Indistinct, broken or small print on several pages
8. Print exceeds margin requirements \_\_\_\_\_
9. Tightly bound copy with print lost in spine \_\_\_\_\_
10. Computer printout pages with indistinct print \_\_\_\_\_
11. Page(s) \_\_\_\_\_ lacking when material received, and not available from school or author.
12. Page(s) \_\_\_\_\_ seem to be missing in numbering only as text follows.
13. Two pages numbered \_\_\_\_\_. Text follows.
14. Curling and wrinkled pages \_\_\_\_\_
15. Other \_\_\_\_\_

**University  
Microfilms  
International**

THE USEFULNESS AND PREDICTABILITY OF  
NET REALIZABLE VALUES:  
AN EMPIRICAL STUDY

A Dissertation

Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
in partial fulfillment of the  
requirements for the degree of  
Doctor of Philosophy

in

The Department of Accounting

by  
Jerry J. Baudin  
B.S., University of Southwestern Louisiana, 1963  
M.B.A., Louisiana State University, 1971  
August, 1982

## ACKNOWLEDGEMENTS

I want to especially thank my dissertation committee chairman, Dr. Vincent C. Brenner, for his guidance, support, and continuous encouragement throughout this study. I also want to thank the other members of my committee: Dr. Anthony P. Curatola, Dr. Kent T. Fields, Dr. Edmund R. Gray and Dr. Bart P. Hartman.

My appreciation is extended to Ms. Mary Feaga of the L.S.U. Department of Experimental Statistics; to other members of the L.S.U. accounting faculty for their encouragement; to the staff in the L.S.U. Office of Budget and Planning (Bob Kuhn, W.C. Chatelain, Ruth Stevens, Daryl Dietrich, Linda Rathburn, Becky Bravata, and Jack Naramore) who managed without me for six months; to the L.S.U. Administration for allowing me the opportunity to pursue and complete my degree; and to my parents, Mr. and Mrs. J.C. Baudin who helped me obtain my first degree almost 20 years ago.

Last, but not least, I dedicate this dissertation to my wife Cecelia for her patience, assistance, understanding and encouragement. To my children, Stanley and Karen, thanks for understanding and being there.

## CONTENTS

	Page
ACKNOWLEDGEMENTS.....	ii
LIST OF TABLES.....	vi
ABSTRACT.....	viii
Chapter	
1. INTRODUCTION.....	1
The Objective of Accounting.....	1
The Objectives of Financial Reporting.....	2
General Objective of Financial Reporting...	3
Specific Objectives of Financial Reporting.	4
The Essential Quality of the Criterion of Usefulness.....	7
Qualitative Characteristics of Accounting Information.....	8
Relevance.....	8
Reliability.....	12
The Principle of Objectivity.....	16
Quality Trade-Offs.....	18
Purpose of the Study.....	20
Organization of the Study.....	21
2. MEASURING AND DETERMINING ACCOUNTING VALUES....	22
Accounting Measurements and Valuations.....	22
Measurement Constraints.....	23
Uncertainty.....	24
Conservatism.....	25
Limitations of Monetary Units.....	25
The Different Valuation Methods.....	26
Conventional or Historical Cost Accounting.	29
Constant Dollar Accounting.....	32

	Page
Current Value Accounting.....	36
Current Value/Constant Dollar Accounting...	46
The Need for Empirical Research.....	48
3. NET REALIZABLE VALUE AS A MEASURE OF CURRENT VALUE.....	51
Net Realizable Value: An Exit Value Method.....	51
Usefulness and Support for Net Realizable Value.....	53
Criteria for Net Realizable Value Data.....	57
Usefulness.....	58
Relevance.....	59
Timeliness.....	60
Reliability.....	61
Verifiability.....	61
Valuing Assets at Net Realizable Value.....	61
Current Assets.....	62
Long-Term Investments.....	62
Fixed Assets.....	62
Summary.....	64
Review of Related Studies.....	65
Brenner Study.....	66
Garner Study.....	67
McKeown Study.....	68
McDonald Study.....	69
Sterling and Radosevich Study.....	70
Parker Study.....	72
Weiner Study.....	73
Gress Study.....	74
Summary of Related Studies.....	75
Statement of the Problem.....	76
4. RESEARCH METHODOLOGY.....	78
Data.....	78
Published Indexes.....	78
Surveyed Data.....	81



	Page
Experimental Design.....	83
Limitations of the Data Collection.....	91
Summary.....	93
5. THE DATA AND DATA ANALYSIS.....	95
The Mail Out, Responses and Data Characteristics.....	95
The Regression Model.....	103
Results of the Tests.....	104
Additional Testing.....	109
Results of the Tests for Group I.....	110
Results of the Tests for Group II.....	110
Two Way Analysis of Variance.....	139
Summary.....	140
6. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....	142
Summary and Conclusions.....	142
Future Research.....	152
BIBLIOGRAPHY.....	156
APPENDIX.....	163
VITA.....	166

## LIST OF TABLES

Table	Page
1. Data Display for the Friedman Two-Way Analysis of Variance by Rank.....	90
2. Responses of Survey Instrument.....	97
3. Demographics of Data.....	98
4. Distribution of Usable Properties (Buildings) By Year of Acquisition and Year of Sale.....	99
5. Minimum and Maximum Values of the Usable Properties (Buildings).....	100
6. Distribution of Properties (Buildings) Included in Developing Models by Year of Acquisition and Year of Sale.....	101
7. Distribution of Properties (Buildings) Included in Holdout Sample by Year of Acquisition and Year of Sale.....	102
8. Multiple Regression Results Model A.....	105
9. Predicted Selling Price and Percentage Relationship in Absolute Terms Twenty-Nine Buildings in the Holdout Sample Model A.....	107
10. Multiple Regression Results Models 1-11.....	113
11. Predicted Selling Price and Percentage Relationship in Absolute Terms Twenty-Four Buildings in the Holdout Sample Model 1.....	116
12. Predicted Selling Price and Percentage Relationship in Absolute Terms Twenty-Four Buildings in the Holdout Sample Model 2.....	118

Table	Page
13. Predicted Selling Price and Percentage Relationship in Absolute Terms Twenty-Four Buildings in the Holdout Sample Model 3.....	120
14. Predicted Selling Price and Percentage Relationship in Absolute Terms Twenty-Four Buildings in the Holdout Sample Model 4.....	122
15. Predicted Selling Price and Percentage Relationship in Absolute Terms Twenty-Four Buildings in the Holdout Sample Model 5.....	124
16. Predicted Selling Price and Percentage Relationship in Absolute Terms Twenty-Four Buildings in the Holdout Sample Model 6.....	126
17. Predicted Selling Price and Percentage Relationship in Absolute Terms Twenty-Four Buildings in the Holdout Sample Model 7.....	128
18. Predicted Selling Price and Percentage Relationship in Absolute Terms Twenty-Four Buildings in the Holdout Sample Model 8.....	130
19. Predicted Selling Price and Percentage Relationship in Absolute Terms Twenty-Four Buildings in the Holdout Sample Model 9.....	132
20. Predicted Selling Price and Percentage Relationship in Absolute Terms Twenty-Four Buildings in the Holdout Sample Model 10.....	134
21. Predicted Selling Price and Percentage Relationship in Absolute Terms Twenty-Four Buildings in the Holdout Sample Model 11.....	136
22. Summary Comparison of the Range of Difference Between Actual and Predicted Selling Prices for Each Model Using the 24 Buildings in the Holdout Sample.....	138
23. Models Ranked by Friedman Rank Sums.....	139

## ABSTRACT

The general objective of financial reporting is to provide useful information for making economic decisions. Net realizable value has been recommended and advocated as a valuation method that would improve the usefulness of reported financial information. One shortcoming of the net realizable value method is that there are no established used market prices for certain fixed assets, such as buildings.

At present, there is no evidence indicating that a solution to this shortcoming has been found. Therefore, the purpose of this study is to empirically test the reliability of using specific price indexes in predicting net realizable values for certain types of buildings.

The top 1,000 publicly held corporations in the United States in 1980 were selected and top financial executives were asked to provide data on completed transactions (entry and exit values) for office, warehouse, and general purpose buildings. Five specific price indexes pertaining to buildings and construction were used in developing the model. All possible least square regressions were performed to test for the "best" index or combination of indexes. One model surfaced as being

statistically significant at the 5 percent level of confidence. Its predictive ability was tested resulting in a wide variance of predicted net realizable values when compared to actual selling prices. Further tests were conducted by dividing the sample population into two time periods: long-term and short-term. The null hypothesis was rejected at the 5 percent level of confidence for all models in the long-term group, while 11 models proved to be statistically significant at the 5 percent level in the short-term group. The predictive ability of each of the 11 models was tested and again the results showed a wide range in predicted values when compared to actual selling prices. Because of the wide difference in values, the practical application of any of the models is questionable in predicting net realizable values for buildings of the type included in the study.

Although the use of the models developed is questionable, this study is an invitation to others to conduct further research in this area.

## Chapter 1

### INTRODUCTION

#### The Objective of Accounting

The Committee to Prepare a Statement of Basic Accounting Theory (ASOBAT) of the American Accounting Association (AAA) defined accounting as "the process of identifying, measuring, and communicating economic information to permit informed judgments and decisions by users of the information."<sup>1</sup> The definition includes three essential accounting characteristics as follows: (1) identifying, measuring, and communicating financial information about (2) economic entities to (3) those individuals in need of the information. The Committee did not limit accounting to conventional measurements, but was receptive to development of other measurements that might better reflect and report accounting information. Further, in the formulation of the statement, the Committee asserted that the criterion for establishing standards for accounting information and communicating accounting information is the usefulness of the information.<sup>2</sup>

---

<sup>1</sup>American Accounting Association, A Statement of Basic Accounting Theory (Chicago, Illinois: AAA, 1966), p. 1. (The Association is hereafter referred to as AAA.)

<sup>2</sup>Ibid., p. 3.

Useful information is information that is relevant, that is, it serves the needs of the users. The AAA described relevance 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.<sup>3</sup>

Information that is not relevant to any user is considered useless in an accounting sense. The definition of accounting in the past 40 years has evolved from one primarily concerned with the fiduciary aspects of accounting to one concerned with measuring and reporting financial information that is useful for decision-making.

### The Objectives of Financial Reporting

Financial reporting includes information communicated via financial statements, as well as by other means, that relate directly or indirectly to the information generated by the accounting system.<sup>4</sup> General and specific purpose financial statements are the primary media through which enterprises communicate financial information to internal and external users.

---

<sup>3</sup>Committee on Accounting Concepts and Standards, Accounting and Reporting Standards for Corporate Financial Statements and Preceding Statements and Supplements (Columbus, Ohio: American Accounting Association, 1957), p. 1.

<sup>4</sup>Financial Accounting Standards Board, "Objectives of Financial Reporting by Business Enterprises," Statement of Financial Accounting Concepts No. 1 (Stamford, Conn.: Financial Accounting Standards Board, November, 1978), par. 7. (The Board is hereafter referred to as FASB.)

### General Objective of Financial Reporting

The overall objective of financial reporting has been set forth several times. The Accounting Principles Board (APB) in Statement No. 4 stated that, "a general objective of financial statements is to provide reliable financial information about economic resources and obligations of a business enterprise."<sup>5</sup> Similarly, the 1973 Report of the Study Group on the Objectives of Financial Statements of the AICPA stated that "the basic objective of financial statements is to provide information useful for making economic decisions."<sup>6</sup> In stating the objectives, the Study Group was emphasizing the output of useful information rather than the accounting process which generates the information. Further, they imply that the basic objective relies on every other accounting objective, standard, principle, procedure, and practice serving the user's needs.<sup>7</sup>

The FASB in its Statement of Financial Concepts No. 1 stated that "financial reporting should provide information that is useful to present and potential investors and other users in making rational investment,

---

<sup>5</sup>Accounting Principles Board, "Basic Concepts and Accounting Principles Underlying Financial Statements for Business Enterprises," Statement No. 4 (New York: AICPA, October, 1970), par. 77. (The Board is hereafter referred to as APB.)

<sup>6</sup>Report of the Study Group on the Objectives of Financial Statements (New York: AICPA, October 1973), p. 25.

<sup>7</sup>Ibid.



credit, and similar decisions."<sup>8</sup> The FASB objective not only encompasses much of what was set forth by others, but broadens the scope to incorporate all of financial reporting, as opposed to just financial statements. The FASB specifically stated that the objectives outlined in the Statement are not restricted to information communicated solely by financial statements, but include all other means of communicating financial information as well.<sup>9</sup>

Both the AICPA Study Group and the FASB identified several specific reporting objectives to support their generalized reporting objectives. The next section elaborates on some of these objectives as they relate to this study.

#### Specific Objectives of Financial Reporting

Economic decisions concerning sacrifices and benefits to be given up or received must be made by investors, creditors, managers and others. In most instances, the user measures the sacrifices or benefits in terms of actual or prospective disbursements or receipts of cash. In line with this, the AICPA Study Group stated that:

An objective of financial statements is to provide information useful to investors and creditors for predicting, comparing, and

---

<sup>8</sup>FASB, "Objectives of Financial Reporting by Business Enterprises," par. 34.

<sup>9</sup>Ibid., par. 7.

evaluating potential cash flows to them in terms of amount, timing and related uncertainty.<sup>10</sup>

Similarly, the FASB stated that:

Financial reporting should provide information to help present and potential investors and creditors and other users in assessing the amounts, timing, and uncertainty of prospective cash receipts from dividends or interest and the proceeds from the sale, redemption, or maturity of securities or loans.<sup>11</sup>

The two objectives are basically the same, however, the FASB objective recognizes "other users" as needing financial information. Both objectives assert that the user must evaluate the risk being taken in the investment or lending decision being contemplated. Cash flow information is a critical factor in evaluating the decision.

A second specific objective treated almost equally by both the AICPA Study Group and the FASB concerns evaluating and measuring management's performance and progress toward achieving enterprise goals. The AICPA Study Group stated that, "an objective of financial statements is to supply information useful in judging management's ability to utilize enterprise resources effectively in achieving the primary enterprise goal."<sup>12</sup>

---

<sup>10</sup>Report of the Study Group on the Objectives of Financial Statements, p. 20.

<sup>11</sup>FASB, "Objectives of Financial Reporting by Business Enterprises," par. 37.

<sup>12</sup>Report of the Study Group on the Objectives of Financial Statements, p. 26.

The FASB stated that:

Financial reporting should provide information about how management of an enterprise has discharged its stewardship responsibility to owners (stockholders) for the use of enterprise resources entrusted to it.<sup>13</sup>

Both the Study Group and the FASB perceived that accountability goes beyond the stewardship function and includes the use and conversion of assets as well as making decisions not to use them and, further, that management is accountable for actions taken to hedge against the economic impacts of inflation and deflation and technological and social changes.

A third specific objective outlined by the Study Group deals with financial information to be reported via the balance sheet. The objective states that:

An objective is to provide a statement of financial position useful for predicting, comparing, and evaluating enterprise earning power. This statement should provide information concerning enterprise transactions and other events that are part of incomplete earnings cycles. Current values should also be reported when they differ significantly from historical costs. Assets and liabilities should be grouped or segregated by the relative uncertainty of the amount and timing of prospective realization or liquidation.<sup>14</sup>

The Study Group did not set forth how significant the differences between current values and historical costs should be before reporting current values. They

---

<sup>13</sup>FASB, "Objectives of Financial Reporting by Business Enterprises," par. 50.

<sup>14</sup>Report of the Study Group on the Objectives of Financial Statements, p. 36.

viewed historical cost basis financial statements as including information on past sacrifices and benefits, and that users need this information as well as information concerning expected sacrifices and benefits which could be provided by reporting current values.

The Essential Quality of the  
Criterion of Usefulness

Usefulness of the accounting information should be the overall criteria for establishing accounting standards and communicating accounting information. Snavelly stated, "the criterion of usefulness occupies the highest level of the criteria hierarchy being the only one that is not restricted in its applicability."<sup>15</sup>

The overall objective of financial reporting is that it should provide information that is useful to present and potential investors and creditors to be used in making rational decisions. Appropriately, the usefulness criterion has surfaced as the principal objective of financial reporting. Beaver, Kennelly and Voss stated that, "almost without exception, the literature has related usefulness to the facilitation of decision making."<sup>16</sup> The accounting data entering and exiting the

---

<sup>15</sup>Howard J. Snavelly, "Accounting Information Criterion, The Accounting Review, 42 (April 1967), p. 224.

<sup>16</sup>William H. Beaver, John W. Kennelly, and William M. Voss, "Predictive Ability as a Criterion for Evaluation of Accounting Data," The Accounting Review, 43 (October 1968), p. 680.

accounting system must possess certain qualitative characteristics to achieve the usefulness criterion.

Qualitative Characteristics of  
Accounting Information

The usefulness of accounting information is not totally dependent upon its qualitative characteristics, but also upon the ability of the users to interpret and understand the data. Before accounting information can be reported to users, it must be evaluated and measured. There are several criteria that apply to the accounting information that enters and exits the accounting system.

Usefulness of the information ranks as the most important; therefore, the qualitative characteristics of accounting information must all be related and interact toward achieving the usefulness criteria.

In its Statement of Financial Concepts No. 2, the FASB states that the two primary qualities which determine the usefulness of accounting information are relevance and reliability and that the ingredients of relevance are predictive value, feedback value and timeliness, while reliability is supported by representational faithfulness, verifiability and neutrality.<sup>17</sup>

---

<sup>17</sup>Financial Accounting Standards Board, "Qualitative Characteristics of Accounting Information," Statement of Financial Accounting Concepts No. 2 (Stamford, Conn: FASB, May, 1980), par. 33.

## Relevance

To be classified as relevant, information must have some effect or bear upon the decision being contemplated. It must be able to influence or make a difference to someone who does not have prior knowledge of the information.

Relevant information need not be predictive, but may be based upon present or past events and be useful in forming, confirming, or changing expectation about the future. The FASB stated that:

To be relevant to investors, creditors, and others for investment, credit, and similar decisions, accounting information must be capable of making a difference in a decision by helping users to form predictions about outcomes of past, present, and future events or to confirm or correct expectations.<sup>18</sup>

If the information provided to users confirms expectations, it enhances the probability that the results will be as predicted, and if the information changes expectations, then the perceived outcomes are also changed. In either case, the information has some influence to one who had no previous knowledge of the information.

There are different degrees of relevance, just as there are different degrees of usefulness of information for specific purposes. For example, a building acquired 10 years ago for \$100,000 might have a current value of \$300,000. Depending on the purpose, both amounts are relevant. Under historical cost, the \$100,000 figure is

---

<sup>18</sup>Ibid., par. 47.

relevant for making depreciation calculations. On the other hand, the \$100,000 figure would have little relevance to a person contemplating the price to pay for the building today. In the second case, the \$300,000 figure would have a high degree of relevance to both the buyer and the seller.

Again, the specific informational needs of the users and the subsequent satisfaction of these needs will dictate the relevancy of the accounting information required. The FASB stated:

One of the more fundamental questions raised by the search for relevance in accounting concerns the choice of attribute to be measured for financial reporting purposes. Will financial statements be more relevant if they are based on historical costs, current costs or some other attribute?<sup>19</sup>

This raises the question as to which measurement method(s) should be used in reporting financial accounting information. The alleged lack of relevance in financial statements is one of the reasons why the information content of financial statements prepared under historical cost is being criticized. The various measurement methods will be discussed in a later section of the study.

Predictive value. If information has predictive value, such as predicting future earnings, cash flows, or earnings per share, it enhances the users' ability to predict, therefore the information is viewed as being relevant. Providing users with relevant information

---

<sup>19</sup>Ibid., par. 50.

increases their knowledge. This should result in better predictions, confirmations, or corrections of earlier expectations. However, accounting information need not predict, but only possess predictive value; therefore, the understanding and interpretation of the information rests with the user. Accordingly, predictions are made by the user of the information.

Feedback value. The relative success of users in predicting outcomes determines feedback value. The FASB stated that, "Information can make a difference to decisions by improving decision maker's capacities to predict or by confirming or correcting their earlier expectations."<sup>20</sup> In other words, feedback is a report on past and current activities and makes a difference in the decision making process by reducing uncertainty in some situations, and supporting or refuting prior expectations.

Timeliness. Relevant information must be available when it is needed. This characteristic of information is called timeliness. The FASB described timeliness as "having information available to a decision maker before it loses its capacity to influence decisions."<sup>21</sup> Timeliness itself does not make information relevant, but the lack of timeliness can cause relevant information to become irrelevant

---

<sup>20</sup>Ibid., par. 51.

<sup>21</sup>Ibid., par. 56.



because it was not available to the user when needed. Consequently, if the user needs financial information that is relevant in order to make predictions and decisions, then information representing current values should be made available. The value or utility of information generally decreases with the passage of time; therefore, information has time value. It can be of most use if it is received on time and reflects up-to-date facts and events. For example, reporting historical costs amounts on the balance sheet that represent costs of assets acquired many years ago will not reflect timely information for someone desiring to know the current value of such assets. To a large extent, the measurement basis used will dictate whether the reported financial information is timely.

### Reliability

Reliability of accounting information implies that the users can rely on the data as representing or reflecting the economic conditions or events that it purports to represent.<sup>22</sup> Accounting information is reliable if the users may depend upon it to reflect the activities and events of the entity. Reliability is dependent upon representational faithfulness, verifiability and neutrality of the data being reported.<sup>23</sup>

---

<sup>22</sup>Ibid., par. 59.

<sup>23</sup>Ibid., par. 62.

Representational faithfulness. The FASB defines representational faithfulness as "correspondence or agreement between a measure or description and the phenomenon it purports to represent."<sup>24</sup> Accounting reports economic resources, the sources of those resources, and the transactions and events that cause changes in them. An accounting measure may be correct, yet the information will not be useful if that which it measured did not incorporate essential characteristics. As an example, a building acquired 25 years ago at a cost of \$500,000 may be irrelevant information to an informed user, however, to an uninformed user who believes that financial statements represent current values, there exist representational failure. Therefore, representational faithfulness presupposes an informed user who understands that accounting statements typically contain amounts reported at cost, and these amounts are often based upon estimates, approximations, allocations, and judgments.

Representational faithfulness also implies freedom from bias from both the measurement and the measurer. With reference to freedom from bias, the AAA stated that:

Freedom from bias means that facts have been impartially determined and reported. It also means that techniques used in developing data should be free of built-in-bias.<sup>25</sup>

---

<sup>24</sup>Ibid., par. 63.

<sup>25</sup>AAA, A Statement of Basic Accounting Theory, p. 7.

Accounting measurements are biased if they are consistently too high or too low. Bias may exist because of the measurement method employed or it may be introduced by the measurer either purposefully or due to lack of skill. Freedom from bias implies that the information is sufficiently complete to insure that nothing material has been excluded, and that the information represents the underlying events and conditions for the period. Completeness in this context means that the information reported must fully disclose all pertinent facts needed by informed users.

Verifiability. Reliable, unbiased and complete information must also be verifiable to provide the necessary assurance that the reported data represent what they purport to represent. Verifiability is directed at eliminating measurer bias more than measurement bias. The FASB stated that, "verification contributes little or nothing toward insuring that measures used are relevant to the decisions for which the information is intended to be useful."<sup>26</sup>

Verifiability means (1) that the accounting data are supported by adequate documentary evidence, and (2) that the same end results would be attained if two or more qualified persons examined the data. Paton and Littleton stated that the test of verifiable, objective evidence has become an important part of accounting and a necessary adjunct to the

---

<sup>26</sup>FASB, "Qualitative Characteristics of Accounting Information," par. 81.

proper execution of the accounting function of providing dependable accounting data.<sup>27</sup>

In Statement No. 4 the APB defined verifiability as follows:

Verifiable financial accounting information provides results that would be substantially duplicated by independent measurers using the same measurement methods.<sup>28</sup>

This implies that there are different measurement methods and that verification only provides assurance that the method used was applied carefully and without personal bias. Verification also implies consensus. The closer the dispersion of a number of different measurements, the greater the verifiability of the item.

Neutrality. As it applies to reliability, neutrality means the absence in reported information of bias intended to attain a predetermined result or to induce a particular mode of behavior. This implies that in establishing and implementing standards and policies, the primary consideration should be the relevance and reliability of the accounting information to be provided, rather than the effect the new rule might have on a particular interest

---

<sup>27</sup>W. A. Paton and A. C. Littleton, An Introduction to Corporate Accounting Standards (AAA, 1955), p. 18.

<sup>28</sup>APB, "Basic Concepts and Accounting Principles Underlying Financial Statements for Business Enterprises," par. 90.

group. The development of standards should be as unbiased as the accounting and reporting of the information itself.<sup>29</sup>

### The Principle of Objectivity

The concept of objectivity has been a dominant factor in the measuring and reporting of accounting information. Accountants, however, have not been able to assign a precise definition to objectivity, even though it is one of the generally accepted accounting principles. As a basic accounting principle, it means that accounting should be based on objective evidence; that is, it should be based on completed arms-length transactions involving the particular entity. The objectivity principle also specifies that in cases where estimates are necessary, they should be objectively determined using rational and systematic procedures.

Ijiri and Jaedicke viewed objectivity in terms of closeness or consensus of the measures to the mean of the measures. Bias or dispersion is interpreted as the difference from the consensus or mean values.<sup>30</sup> Moonitz described objectivity as "unbiased; subject to verification

---

<sup>29</sup>FASB, "Qualitative Characteristics of Accounting Information," par. 98.

<sup>30</sup>Yuji Ijiri and Robert K. Jaedicke, "Reliability and Objectivity of Accounting Measurements," The Accounting Review, 41 (July 1966), p. 481.

by another investigator."<sup>31</sup> In a Statement of Basic Accounting Theory, the AAA recommended four basic standards to be used in evaluating potential accounting information. They are: relevance, verifiability, freedom from bias, and quantifiability.<sup>32</sup> Although, objectivity was not listed as a standard, both verifiability and freedom from bias encompass objectivity. Verifiability requires that the same end results would be reached if two or more qualified persons examined the data, while freedom from bias means that the data have been impartially obtained, determined, and reported.

Objectivity has the characteristic of having a high degree of verifiability and reliability, and rests on the premise that the usefulness of financial information is dependent upon the data being objectively determined, factual, and verifiable. Objectivity and verifiability provide theoretical support for conventional historical cost basis accounting. Objectivity favors reliability over relevance in that it is concerned more with the verifiability characteristics than whether the information serves the needs of the users.

---

<sup>31</sup>Maurice Moonitz, "The Basic Postulates of Accounting," Accounting Research Study No. 1 (New York: AICPA, 1961) p. 42.

<sup>32</sup>AAA, A Statement of Basic Accounting Theory, p. 7.

### Quality Trade-Offs

Usefulness, relevance, reliability and objectivity are all necessary in the reporting of financial information. All are theoretically sound, but in practice each cannot be achieved completely. If the emphasis is placed on objectivity and reliability (verifiability), the financial data reported may not be relevant, therefore not useful. For example, property, plant and equipment acquired seven years ago are reported in the financial statements at historical cost, which was objectively determined, (free from bias), and is verifiable. Is this information relevant and timely to an investor or creditor who is interested in the current value of these assets? On the other hand, current values may be obtained through some method that is determined less objectively than the amounts reported under historical cost. The data may represent estimations of current values rather than actual current values.

There must exist a trade-off between objectivity/reliability/verifiability and relevance/timeliness if useful financial information is to be communicated to users. Edwards and Bell provided the following comment concerning the trade-off:

Too frequently, in our opinion, the objective principle is used as a means of excluding subjective judgment from accounting decisions without regard for the effect this exclusion may have on the decision making process of the firm as a whole. If in order to adhere as strictly as possible to the objectivity principle, the accounting department reduces the

usefulness of the accounting data furnished to management, managerial efficiency can be adversely affected.<sup>33</sup>

Similarly, Sterling said that, "a guess at a relevant figure is definitely more valuable than precise and objective irrelevancy."<sup>34</sup>

Relevance and timeliness cannot take a secondary role to objectivity, reliability and verifiability, if usefulness is the ultimate aim of the financial information communicated to users. None, however, can be discarded or overlooked; therefore, in order to meet the objectives of financial reporting some degree of objectivity and reliability will have to be given up in order to increase relevancy and timeliness which will result in the increased usefulness of the financial information reported.

From the foregoing discussion, one can surmise that accounting must measure and communicate useful financial information to informed users for making rational decisions. Further, the information communicated must possess the characteristics of relevancy, timeliness, predictive value, feedback value, reliability, representational faithfulness, verifiability, neutrality, and objectivity.

---

<sup>33</sup>Edgar O. Edwards and Phillip W. Bell, The Theory and Measurement of Business Income (4th ed., Berkeley, California: University of California Press, 1967), pp. 283-84.

<sup>34</sup>Robert R. Sterling, "Conservatism: The Fundamental Principle of Valuation in Traditional Accounting," ABACUS (December 1967), p. 131.



Given the objective of financial reporting and the qualitative characteristics of the information to be reported, the achievement of the objective rests primarily with the measurement process.

### Purpose of the Study

There has been a growing dissatisfaction with the financial information being reported via financial statements prepared under conventional historical cost. Inflation and price-level changes are causing many to question the usefulness of the data being reported. The current trend in this country, as evidenced first by the Securities and Exchange Commission Release No. 190, and now FASB Statement No. 33, is toward the reporting of current value accounting data.

This study will identify the various current value methods, and then specifically set forth the need for, and the usefulness of, current value data produced under one such method: net realizable value. However, one of the problems with the net realizable value method relates to the difficulty of obtaining objective measures of current value for certain fixed assets. The purpose of this study is to empirically test the reliability of specific price indexes in predicting net realizable values for certain fixed assets. Such a procedure, if proven reliable, would provide a simple, inexpensive and objective way of determining net realizable value for these types of assets.

### Organization of the Study

The first chapter is primarily concerned with establishing the purpose of accounting and the objectives of financial reporting. Usefulness of financial reporting surfaces as the most essential criteria. The purpose of the study is also included in the first chapter. The second chapter discusses accounting measurements, measurement constraints, valuations, and the different valuation methods. Chapter 3 is a literature review devoted to net realizable value as a measurement of current value. The usefulness of, support for, and the arguments against net realizable are included. The chapter also contains a discussion of the use of net realizable value on the balance sheet and a review of pertinent studies that have been done in the area of current value accounting. The statement of the research problem is presented at the end of the chapter. The research methodology and experimental design are delineated in Chapter 4. Also included are the population sampled, the survey instrument used, the data collected for the study, the specific price indexes used, and the limitations of the data collection. The fifth chapter is devoted to an analysis of the data and testing of the predictive model. The summary, conclusions, and recommendations are presented in Chapter 6.

## Chapter 2

### MEASURING AND DETERMINING ACCOUNTING VALUES

#### Accounting Measurements and Valuations

Measurement in accounting may be viewed as the assignment of numbers to objects and events. The determination of what numbers to assign must be based on some valuation theory. Chambers, in discussing valuations, stated that:

The sacrifice one is prepared to make in the expectation of attaining any end is an index of the worthwhileness or value attributed to that end. It is an index, not a measure . . . Valuation, which is part of the process of choosing, is likewise directed towards future possible consequences.<sup>1</sup>

Chambers views values as being subjective, and attributed on the basis of belief and that the utility and availability of goods and services dictate the values.

There is a close relationship between measurement and valuation and in many cases the literature will substitute one for the other. Sprouse stated: "In recent years, the terms measure and measurement have found

---

<sup>1</sup>Raymond J. Chambers, Accounting, Evaluation, and Economic Behavior (Englewood, New Jersey: Prentice-Hall, Inc., 1965), p. 42.

increasing use in the accounting literature as substitutes for value and valuation".<sup>2</sup> Many view valuation in accounting as the process of assigning meaningful quantitative monetary amounts. The ASOBAT Committee of the AAA stated:

The quantification of data adds usefulness. Measurement in its most primitive aspect involves forming classes of equivalent objects of events . . . . Qualitative information is of course important, but the accounting function emphasizes meaningful quantification represented by numbers to increase usefulness . . . . Some attribute or characteristic of an item or an activity under examination is quantified. Consideration must be given to the characteristic selected, the measure applied, and the manner in which this is accomplished. In accounting, the attribute most often selected is economic usefulness (in a narrowly defined sense) and the most often applied is dollars of value of cost.<sup>3</sup>

Accounting must identify, measure and assign values to objects and events. There must exist some basic structure for the measurement process.

#### Measurement Constraints

Even with a structured measurement process, there are still certain measurement constraints. The measurer of financial information must choose from among different methods and procedures available in measuring and valuing the accounting information. He or she must be familiar

---

<sup>2</sup>Robert T. Sprouse, "The Measurement of Financial Position and Income Purpose and Procedure," Research in Accounting Measurement, ed. Robert K. Jaedicke, Juji Ijiri, and Oswald Nielsen (Chicago, Illinois: AAA, 1966), p. 197.

<sup>3</sup>AAA, A Statement of Basic Accounting Theory, p. 12.

with the measurement process and must determine all the relevant facts and events associated with the information to be measured. The accountant must be careful that none are overlooked or downplayed. Often, the accountant must use his or her own judgment in deciding which procedure or rule to apply in a given situation. As a result, there exists the opportunity for unintentional personal bias to enter the accounting process.

There are certain other characteristics of the environment that place limitations on the accuracy and reliability of measurements. Constraints such as uncertainty, conservatism and an unstable monetary unit cannot be removed by the measurer; therefore, they should become part of the process in selecting the proper measurement methods and procedures.

### Uncertainty

Uncertainty arises because the assumption is made that entities are expected to continue in operation in the future; that is, the entities are viewed as going concerns. That being the case, allocations to past, present and future periods must be made. These allocations are made on the basis of some expectations regarding the future. For example, measuring the estimated liability associated with product warranties is usually determined using past history. Although the measurement is based on an estimate, this should not prohibit making the estimate as accurately as

possible, and adjustments and/or corrections being made as new and more reliable information becomes available.

### Conservatism

Conservatism directly impacts the measurement process. Uncertainty of events has served as the primary basis for the application of the concept of conservatism. In many cases, conservatism places a constraint on the data reported such that its relevancy and reliability are questionable. Conservatism promotes the tendency to understate both income and net assets, and report the highest values for liabilities and expenses.

There are also innate contradictions between the idea of conservatism and the concept of freedom from bias. Freedom from bias implies that the facts have been impartially determined, the procedures used are also free from bias, nothing material has been excluded, and the information represents the underlying events and conditions for the period. Conservatism on the other hand, causes the real facts and events, in many instances, to be substituted by others that are more pessimistic thereby biasing the reported data.

### Limitations of Monetary Units

Financial reporting is basically in terms of monetary units, even though accounting information contains other than monetary information. If the monetary unit is stable over time, then the measures provided are relevant

and reliable. If on the other hand, the monetary unit is not stable over time, misinterpretation and noncomparability of data from period-to-period will result. A decrease in the purchasing power of the monetary unit (inflation) causes the measurement process to report data originating from prior periods in dollars of different purchasing power than transactions occurring in the current period. To overcome this, accounting data based on past exchange prices must be adjusted to current prices in order to provide financial statements in monetary units that have common purchasing power. Chambers stated that:

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.<sup>4</sup>

Given the constraints on the measurement process, the objective should be to consider all possible measurement alternatives and select the method(s) that will communicate useful financial information to those in need of the information.

#### The Different Valuation Methods

To a great extent the usefulness of the financial information to both internal and external users relies on the valuation or measurement method used. The method used

---

<sup>4</sup>R. J. Chambers, "Price-Level Adjusted Accounting," The Accountant, 162 (March 19, 1970), p. 408.

will establish asset values, and therefore directly affect the reported income figure.

Asset valuation concepts can be classified into two groups: (1) those based on entry values, and (2) those based on exit values. Entry values represent the measures of consideration given up in acquiring the assets for use in the operations of the entity. Entry values may be expressed in terms of historical cost, replacement cost, and the amounts produced by these methods adjusted for changes in the price-level.

Exit values are the funds received or to be received by the entity when the assets or their services leave the entity. Exit values may be expressed in terms of present value of future cash flows, liquidation value, and net realizable value. Further, exit values can be adjusted for changes in the general purchasing power which results in a valuation method referred to as price-level adjusted current value.

The various valuation methods under both entry and exit values can be categorized into four reporting approaches:

<u>Approach</u>	<u>Valuation Method</u>
(1) Conventional or Historical Cost Accounting	• Historical Cost
(2) Constant Dollar Accounting	• General Price-Level
(3) Current Value Accounting	• Replacement Cost • Present Value of Future Cash Flows • Liquidation Value • Net Realizable Value



<u>Approach</u>	<u>Valuation Method</u>
(4) Constant Dollar/Current Value Accounting	• Price-Level Adjusted Current Value

Each valuation approach or method has its own group of supporters, and each group claims that its method achieves the objectives of financial reporting. Ijiri<sup>5</sup> and Ernst and Ernst<sup>6</sup> defend historical cost; Hendriksen<sup>7</sup>, and Sprouse and Moonitz<sup>8</sup> recommend using some form of current value; Edwards and Bell<sup>9</sup> advocate using present replacement costs; Chambers<sup>10</sup> advocates using the market selling price of assets (net realizable value); and Sterling<sup>11</sup> recommends using price-level adjusted current value.

---

<sup>5</sup>Yuji Ijiri, "A Defense of Historical Cost Accounting," Readings in Inflation Accounting, ed. P. T. Wanless and D. A. R. Forrester (Chicester, England: Wiley and Sons, 1979), p. 62.

<sup>6</sup>Ernst and Ernst, Financial Reporting Briefs, Cleveland: Ernst and Ernst, 1977), p. 2.

<sup>7</sup>Eldon S. Hendriksen, Accounting Theory, rev. ed. (Homewood, Illinois: Richard D. Irwin, Inc., 1970), p. 268.

<sup>8</sup>Robert T. Sprouse and Maurice Moonitz, "A Tentative Set of Broad Accounting Principles for Business Enterprises," Accounting Research Study No. 3 (AICPA, 1962), pp. 1-59.

<sup>9</sup>Edwards and Bell, p. 284.

<sup>10</sup>R. J. Chambers, Accounting Evaluation and Economic Behavior, p. 218.

<sup>11</sup>Robert R. Sterling, "Relevant Financial Reporting in an age of Price Changes," Journal of Accountancy, (February 1975), pp. 42-51.

### Conventional or Historical Cost Accounting

Historical cost has been the dominant valuation method used as the basis for keeping accounting records and reporting financial information. One of the basic principles of accounting is referred to as "the historical cost principle." Historical costs are the monetary sacrifices given up or required to obtain assets or services. Cost includes all payments associated with getting the asset ready for use in the operations of the entity. An advantage attributed to recording of transactions at cost is that cost is viewed as being definite, determinable, and verifiable. Such transactions are presumed to represent objective measurements produced by completed arms-length transactions. Also, in the case of an asset, valuation of its service potential is assumed to be as great as its purchase price, and subsequent changes in the value of its future services are not considered sufficiently objective to justify their recognition until the disposal of the asset.<sup>12</sup> In other words, even though economic conditions can change after the asset is acquired, historical cost accounting rarely dictates a change in the carrying value of the asset. Exceptions to this rule occur when the lower-of-cost or

---

<sup>12</sup>AAA, Committee on Concepts and Standards - Long-Lived Assets, "Accounting For Land, Buildings, and Equipment, Supplementary Statement No. 1," The Accounting Review, 39 (July 1964), pp. 693-699.

market concept is applied to inventories and short-term investments.

Advantages attributed to the use of historical cost as a valuation method include:

(1) Its main advantage is that it is verifiable, it has close relationship to the realization concept in the measurement of income.<sup>13</sup>

(2) It serves conservatism; it is less costly to use; it is objective and provides a measure of protection; it is useful in making decisions.<sup>14</sup>

Mautz specifically 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 taken place.<sup>15</sup>

In support of historical cost, Ijiri asserted that:

Historical cost valuation provides data that are less disputable than data provided under other valuation methods currently being proposed, an essential requirement in equity accounting.<sup>16</sup>

Littleton saw a necessity for historical cost because he viewed executives as needing such information to judge the outcome of prior commitments which require a classified record of transactions recorded at historical

---

<sup>13</sup>Hendriksen, p. 267.

<sup>14</sup>R. K. Mautz, "A Few Words for Historical Costs," Financial Executive, 41 (January 1973), p. 23.

<sup>15</sup>Ibid.

<sup>16</sup>Yuji Ijiri, p. 73.

cost.<sup>17</sup> Historical cost in this context is associated with the evaluation of the stewardship function of management.

The disadvantages of the use of historical cost include: (1) (i) failure to recognize the change in value of an asset over time; (ii) failure to permit recognition of gains and losses in the periods in which they may actually occur; (iii) costs of assets acquired in different time periods cannot be added together to provide useful and meaningful data; (iv) prohibition of the use of other more useful valuation methods;<sup>18</sup> (2) historical costs are inequitable in inflationary periods;<sup>19</sup> (3) cost is a method, not an objective and should be viewed in context with other methods in providing useful information.<sup>20</sup> Knortz stated that:

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 historical cost and (2) the principle of realized earnings. These evils, more than any other factors or accounting practices, have caused legislatures, courts,

---

<sup>17</sup>A. C. Littleton, "Significance of Invested Costs," The Accounting Review, (April 1952), p. 171.

<sup>18</sup>Hendriksen, pp. 267-68.

<sup>19</sup>James H. MacNeill, "Response to a Defense for Historical Cost Accounting," in Asset Valuation, ed. Robert R. Sterling (Lawrence, Kansas: Scholars Book Co., 1971), pp. 15-18.

<sup>20</sup>Arthur Andersen & Co., Objectives of Financial Statements for Business Enterprises (Arthur Andersen & Co., 1972), pp. 34-35.

and the public to be suspicious of financial reports of reputable companies certified by reputable public practitioners.<sup>21</sup>

The major criticism of the use of historical cost as the valuation basis for producing reportable financial information to users is that it misleads and loses its relevance because it fails to consider general or relative changes in prices.

#### Constant Dollar Accounting

The unit of accounting measurement in this country is the dollar. If a dollar cannot buy the same basket of goods that it bought years ago, then inflation has occurred. This has a direct impact on accounting since accounting assumes that the monetary unit will remain stable over time. Because of the inflationary spiral this country has been experiencing since the mid-1960's, the accounting profession began looking at ways to improve the financial information being reported to users.

Constant dollar accounting is concerned with changing the measuring unit but retaining the historical cost model. Constant dollar accounting utilizes the same accounting principles of asset valuation and income measurement as used under historical cost accounting. The difference between the two methods is that historical cost accounting treats a dollar expended as a fixed measure of

---

<sup>21</sup>Herbert C. Knortz, "The Challenge of Economic Realism," The Financial Executive, 41 (January 1973), p. 18.

value, so that a fixed asset purchased in 1967 is shown on the 1982 balance sheet in terms of 1967 dollars (actual cost), while constant dollar accounting uses a general price index to adjust the historical cost value.

Carscallen and Johnson stated that:

General price level accounting recognizes that currency changes in value over time. It measures asset cost in current currency values, regardless of when the assets were actually purchased. This is done by identifying the current unit (for example, a 1968 or a 1973 dollar) in which each item was purchased and then converting that currency unit into equivalent current money units by applying a general price index that is considered approximately the change in the value of money.<sup>22</sup>

The AICPA was one of the first bodies to recognize and advocate general price-level accounting. In its Accounting Research Study No. 6 issued in 1963, it concluded that, "the effects of price-level changes should be disclosed as a supplement to the conventional statements . . . at least one index of the general price-level is available in the United States and is reliable enough for use in financial statements."<sup>23</sup> The Accounting Principles Board (APB) issued Statement No. 3 in 1969 entitled,

---

<sup>22</sup>Morley P. Carscallen and Kenneth P. Johnson, Financial Reporting Under Changing Values: An Introduction to Current Value Accounting, ed. by Warren Chippendale and Philip L. Defflese, (American Management Association, 1977), p. 9.

<sup>23</sup>AICPA, "Reporting the Financial Effects of Price-Level Changes," Accounting Research Study No. 6, New York: AICPA, 1963), p. XI.

"Financial Statements Restated for General Price-Level Changes." It is probably the most comprehensive work published by an authoritative source dealing with price-level accounting. The APB recognized that general price-level financial statements or pertinent information extracted from the statements present useful financial information not available from statements prepared under conventional historical cost.<sup>24</sup> From 1974 through 1979, several professional bodies issued statements advocating and/or supporting the use of price-level accounting.<sup>25</sup> On the other hand, the Securities and Exchange Commission strongly rejected the concept of price-level accounting.<sup>26</sup>

There are several advantages and disadvantages that have been attributed to price-level accounting. Elwood L. Miller has identified them as follows:

(1) General price-level statements measure changes in general levels now ignored by disclosing the impact of inflation on the general purchasing power of the dollar.

(2) Statements are reliable enough for reporting purposes since statements are primarily oriented toward third parties.

---

<sup>24</sup>APB, "Financial Statements Restated for General Price-Level Changes," Statement No. 3, II (New York: AICPA, 1973), p. 9013.

<sup>25</sup>For example see: "Reports from the Committee on Financial Accounting Standards," The Accounting Review, (Supplement to Vol. 51 1967), 214-61 and FASB, "Financial Reporting in Units of General Purchasing Power," Exposure Draft, (Stamford, Conn: FASB, 1974).

<sup>26</sup>John C. Burton, "Financial Reporting in an Age of Inflation," Journal of Accountancy (February 1975), pp. 68-71.

(3) Statements are sufficiently objective and verifiable.

(4) General price-level is relatively easy to apply.

(5) Statements facilitate comparability by using common unit of measure.

(6) General price-level represents a less drastic departure from historical cost.<sup>27</sup>

Included as some of Miller's disadvantages of price-level accounting statements are:

(1) General price-level does not account for changes in specific prices.

(2) General price-level is not logically consistent. While specific changes are said to be ignored, price-level adjusted amounts reported for assets cannot be greater than their net realizable values.

(3) Results could be misleading.

(4) Statements ignore other effects on prices, such as technology, competition and economic environment of some companies.<sup>28</sup>

Constant dollar accounting assumes that inflation falls equally on all entities and all types of assets and costs. It appears that the supportive arguments for constant dollar accounting are that it is objective and retains the historical cost concept. If usefulness is viewed as the highest criterion for reporting of financial information, then the objectivity and historical cost arguments lose some credibility. As was pointed out

---

<sup>27</sup>Elwood L. Miller, "What's Wrong with Price-Level Accounting," Harvard Business Review, (November-December 1978), p. 113.

<sup>28</sup>Ibid., p. 114.



earlier, some degree of objectivity and reliability will have to be given up to increase relevancy, and thus usefulness of reported financial data. Probably one of the overall arguments against the complete acceptance of constant dollar accounting is the fact that it does not reflect current values.

### Current Value Accounting

Current value accounting is the term used to describe a family of accounting concepts that measure assets by reference to their present worth rather than their historical cost. In this study, current value means any of the valuation methods other than conventional historical cost and general price-level adjusted historical cost. These current value methods include, but are not limited to, replacement costs, present value of future cash flows, liquidation value, and net realizable value (not from forced sale). As discussed previously, value is an elusive concept and a difficult one to measure. That is the primary reason why several methods of determining current value have been advocated.

In 1944, James L. Dohr in an article appearing in the Journal of Accountancy stated that:

The financial significance of property is manifestly to be determined largely from present facts and prospects rather than from past facts, the latter are ordinarily of importance only so far as they may be said to indicate what is likely to happen in the future. As a result the present value of property is, generally speaking,

the factor of outstanding importance; it indicates, with varying degrees of accuracy, what the owner may expect to realize upon a sale; it determines his borrowing capacity in so far as the property is concerned; it fixes his liability for various forms of taxation; it reflects his earnings capacity as owner; it may be said to measure his ability to make gifts; it is the basis upon which the property may be insured.<sup>29</sup>

In 1962, Sprouse and Moonitz in Accounting Research Study No. 3, addressed the measurement of assets in terms of valuation of future benefits anticipated. They saw the choice of methods for valuing assets as being made from three exchange prices: (1) a past exchange price (acquisition cost), (2) a current exchange price (replacement cost), and (3) a future exchange price (anticipated selling price).<sup>30</sup> From 1936 to 1957, the AAA in its various releases had supported the concept of historical cost. But beginning in 1964, several AAA Committees began recommending the use of current values for reporting financial information.<sup>31</sup>

---

<sup>29</sup>James L. Dohr, "Cost and Value," Journal of Accountancy (March, 1944), p. 193.

<sup>30</sup>Robert T. Sprouse and Maurice Moonitz, pp. 23-24.

<sup>31</sup>For example see:  
 AAA, Committee on Inventory Measurement, "A Discussion of Various Approaches to Inventory Measurement," The Accounting Review, 39 (July 1964), pp. 700-14.  
 AAA, Committee on Concepts and Standards - Long-Lived Assets, pp. 693-99.  
 AAA, Committee on the Realization Concept, "The Realization Concept," The Accounting Review, 40 (April 1965), pp. 312-33.  
 AAA, A Statement of Basic Accounting Theory, pp. 19-36.

The Committee on Concepts and Standards--Long-Lived

Assets stated that:

The current cost of obtaining the same or equivalent services should be the basis for valuation of assets . . . Where there is an established market for assets of like kind and condition, quoted prices may provide the most objective evidence of current cost. Such prices may be readily available for land, buildings, and certain types of standard equipment . . . In other cases, adjustment of historical cost by the use of specific price indexes may provide acceptable approximations of current cost.<sup>32</sup>

The Committee recommends that current cost be adopted immediately as the basis of valuation for land, buildings and equipment wherever the amounts involved are significant and the available measures of current cost are sufficiently objective.<sup>33</sup>

The Committee did not provide any specific details concerning the definition of "significant". In 1966, the Committee to prepare ASOBAT recommended that current value financial information be included as supplementary data reported to users of financial information. The Committee stated with reference to the dissatisfaction with the then existing accounting practices that:

A principle criticism relates 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.<sup>34</sup>

---

<sup>32</sup>AAA, Committee on Concepts and Standards - Long-Lived Assets, p. 695.

<sup>33</sup>Ibid., p. 698.

<sup>34</sup>AAA, A Statement of Basic Accounting Theory, p. 19.

The AICPA in 1973 also supported the use of current values in its Objectives of Financial Statements publication. The Study Group of that organization stated, "The Study Group believes that the objectives of financial statements cannot be best served by the exclusive use of a single valuation basis."<sup>35</sup> The Study Group also recommended that, "current values should also be reported when they differ significantly from historical costs."<sup>36</sup>

Through the 1960's there was ever increasing support for the use of current value accounting. Although, the support from the AAA may have been viewed as highly theoretical, the support from the AICPA and a major public accounting firm (Arthur Andersen & Co.),<sup>37</sup> added additional importance to current value accounting.

In 1976, the SEC issued Accounting Series Release No. 190 which required affected companies to disclose replacement cost data for certain items. The purpose of Release No. 190 was to provide investors with information about the current cost of inventories and productive capacity which would assist them in understanding the current costs of operating the entity. Replacement cost was defined as the lowest cost that would be paid for a

---

<sup>35</sup>Report of the Study Group on the Objectives of Financial Statements, p. 41.

<sup>36</sup>Ibid., p. 64.

<sup>37</sup>Arthur Andersen & Co., pp. 16-18.

new asset with the same equivalent operating or productive capacity.

Release No. 190 was superseded in 1979 by FASB Statement No. 33 which requires certain large, publicly held enterprises to disclose supplementary information on both a constant dollar and current cost basis. FASB No. 33 defined current cost of property, plant and equipment as the current cost of acquiring the same service potential inherent in the asset owned. The FASB stated that Statement No. 33 was based on the objectives established in FASB Concepts Statement No. 1, Objectives of Financial Reporting by Business Enterprises. FASB No. 33 is viewed as a five-year experiment to ascertain if the supplemental reporting of constant dollar and current cost data increases the usefulness of the financial information reported to users.

The current trend is definitely toward reporting some form of current value data. Many see it as more relevant for statement user's purposes. Some advantages that have been attributed to current value accounting include:

- (1) The 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) The summation of assets expressed in current terms is more meaningful than the addition of historical cost incurred at different time periods.<sup>38</sup>

(3) The use of value accounting will make financial statements more comparable among entities.<sup>39</sup>

(4) Prospective long-term creditors will be in a better position to determine the extent of the security available to back the loan. Balance sheets will supply more correct current-asset ratios. Current cost data would make hidden reserves or watered stock impossible.<sup>40</sup>

(5) Current value accounting provides better calculation of return on investment.<sup>41</sup>

(6) Value accounting will provide information on the entity's ability to adapt to an ever changing environment.<sup>42</sup>

(7) The balance sheet will contain information that users need.<sup>43</sup>

---

<sup>38</sup>Hendriksen, p. 268.

<sup>39</sup>Edwards and Bell, pp. 122-23.

<sup>40</sup>G. Kenneth Nelson, "Current and Historical Costs in Financial Statements," The Accounting Review, 41 (January 1966), pp. 44-45.

<sup>41</sup>Norton M. Bedford and James C. McKeown, "Comparative Analysis of Net Realizable Value and Replacement Costing," Readings in Inflation Accounting, p. 255:

<sup>42</sup>Raymond C. Chambers, Accounting Evaluation and Economic Behavior, p. 92.

<sup>43</sup>William A. Paton, Accounting Theory, ed. Robert R. Sterling (Lawrence, Kansas: Scholars Book Company, 1973), p. 442.

(8) Meaningful return of capital calculations may be made.

(9) Pricing decisions are improved.

(10) Value accounting prevents weakening of entity by restricting payment of dividends to real profits.<sup>44</sup>

(11) The information generated may be better for making predictions.<sup>45</sup>

(12) Although probably less objective than historic cost, current values should be more useful and accurate in the sense that they represent reality, that is, current events of the period. The use of price indexes makes the concept more verifiable.<sup>46</sup>

Some arguments advanced against value accounting are:

(1) Value is difficult to define and subject to restatement.<sup>47</sup>

(2) Historical cost uses data determined objectively, whereas value accounting incorporates more subjectivity.<sup>48</sup>

---

<sup>44</sup>R. S. Gynther, Accounting for Price-Level Changes: Theory and Procedures (Oxford: Pergamon Press, 1960), pp. 44-45.

<sup>45</sup>Lawrence Revsine, Replacement Cost Accounting (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973), Ch. 5.

<sup>46</sup>Edwards and Bell, p. 284.

<sup>47</sup>"Statements to the Study Group on Financial Statements," CPA Journal, 42 (November 1972), p. 886.

<sup>48</sup>Ernst and Ernst, "Additional Views on Accounting Objectives," (n.p.: May 1972), p. 19.

(3) Replacement costs are difficult to measure objectively, therefore data reported may be subject to management manipulation.<sup>49</sup>

(4) Current cost is not always an estimate of the fair market value of the asset. Its value is a function of the future cash flows it will generate.<sup>50</sup>

(5) It may be costly to obtain current values and expenses associated with capturing data may be greater than benefits to be derived.<sup>51</sup>

(6) Value accounting is not needed. Supplementary disclosures will provide the necessary information without having to shift to unknown, undefined, and uncontrollable values. Historical cost statements provide a proven, acceptable concept of measuring income and assets. It provides quality information that is understandable and the underlying limitations are well publicized.<sup>52</sup>

Current value accounting is said to produce accounting data that are more useful than data generated

---

<sup>49</sup>Robert L. Dickens and John O. Blackburn, "Holding Gains on Fixed Assets: An Element of Business Income," The Accounting Review, 39 (April 1964), p. 315.

<sup>50</sup>Donald E. Kieso and Jerry J. Weygandt, Intermediate Accounting (New York: John Wiley & Sons, Inc., 1980), p. 1143.

<sup>51</sup>L. S. Rosen, Current Value Accounting and Price-Level Restatements (Toronto: Institute of Chartered Accountants, 1972), p. 115.

<sup>52</sup>Robert K. Mautz, "A Few Words for Historical Costs," Financial Executive, 41 (January 1973), pp. 23 & 27.



under historical cost. The issuance of FAS No. 33 represents significant progress toward the reporting of current values. The accounting profession has recognized the problem and has initiated an experiment that will, hopefully, prove the need for and usefulness of reporting current values to users of financial information. Bevis, in appraising current value accounting stated:

I think fair value accounting is a necessity. . . . If we are to serve the investor, especially considering the effects of inflation, technological changes, changes in social philosophies, and changes in consumer desires, I do not think we can ignore this need for change. Further, I think management needs something better to aid it in decision-making in order to appraise their alternative sources of action.<sup>53</sup>

There are several different asset valuation methods which may be used under current value accounting to measure the current cost of plant, property, and equipment. The principal methods are:

(1) Current replacement cost - defined as the current cost of acquiring assets identical to those owned or the current cost of acquiring the same service potential as embodied in the assets currently owned. Value is adjusted for age of asset.

(2) Present value of future cash flows - defined as the future amount the firm expects to realize from the use

---

<sup>53</sup>Donald J. Bevis, "Appraising the Four Schools," Asset Valuation and Income Determination, ed. Robert R. Sterling (Lawrence, Kansas: Scholars Book Co., 1971), p. 131.

of the assets being measured discounted at an appropriate rate of interest. This method is more plausible for monetary assets and liabilities.

(3) Liquidation value - defined as the amounts that would be received as a result of the sale of the assets through liquidation proceedings.

(4) Net realizable value - defined as the selling price (not from a forced sale) of the firm's assets in the market less cost that would be incurred in selling.

FAS No. 33 supplemental disclosures require the current cost of acquiring the same service potential as embodied in the assets currently owned as the method of valuing plant, property, and equipment. It also states that a used asset may be valued at the current cost (market value) of a similar used asset.<sup>54</sup> This would represent the net realizable value of the used asset. Further, the Statement specifies that net realizable value will be used as a measurement when the asset is about to be sold.<sup>55</sup> FAS No. 33 specifies that companies may use various types of information to determine cost of property, plant and equipment. The types include:

---

<sup>54</sup>FASB, "Financial Reporting and Changing Prices," Statement of Financial Accounting Standards No. 33 (Stamford, Conn., FASB, September, 1979), par. 180.

<sup>55</sup>Ibid., par. 99.

(1) Indexation - externally or internally generated for the class of goods or services being measured.

(2) Direct pricing - current invoice prices, vendors' price lists or other quotations or estimates, and standard manufacturing costs that reflect costs.<sup>56</sup>

FAS No. 33 and current value reporting are both in the experimental stage in this country. Arthur Young & Co. found, in a recent study, that financial statement preparers followed one of two interpretations in determining current cost or property, plant, and equipment.<sup>57</sup> A majority used a reproduction approach (cost of acquiring assets identical to those owned), as opposed to using replacement cost approach advocated by FAS No. 33 which involves replacement of equivalent, rather than identical, production capabilities.

#### Current Value/Constant Dollar Accounting

This approach was advocated by Robert Sterling.<sup>58</sup> He identified it as price-level adjusted current value. It combines constant dollar and current value accounting in an attempt to identify and report holding gains and losses

---

<sup>56</sup>Ibid., par. 60.

<sup>57</sup>Arthur Young & Co., Financial Reporting and Changing Prices: A Survey of Preparers' Views and Practices, (New York: Arthur Young & Co.), p. 17.

<sup>58</sup>Robert R. Sterling, "Relevant Financial Reporting in the Age of Price Changes," Journal of Accountancy (February 1975), pp. 42-51.

after eliminating the effects of general inflation. Comparative balance sheets are presented with one representing the beginning of the period current cost (entry dates) adjusted for price-level changes using a general price index, and the balance sheet for the end of the period (exit dates) adjusted to represent current values. The differences (gains and/or losses) would be reported on the income statement at the end of the period. Sterling used current cash equivalents (net realizable values) as a measurement of current value for the assets in his case example.

Chambers commented on Sterling's proposed approach, and basically agreed with the concept.<sup>59</sup> FAS No. 33 requires that increases or decreases in the current costs of inventory, property, plant, and equipment (which is the difference between the current values at the beginning and end of the period) shall be reported both before and after eliminating the effects of general inflation.<sup>60</sup> Thus, price-level adjusted current value is one of the reporting methods to be used under requirements of FAS No. 33 which defines current value/constant dollar accounting as:

---

<sup>59</sup>R. J. Chambers, "NOD, COG and PuPu: see how inflation teases!," Journal of Accountancy (September 1975), pp. 56-62.

<sup>60</sup>FASB, "Financial Reporting and Changing Prices," par. 56.

A method of accounting based on measures of current cost or lower recoverable amount in terms of dollars, each of which has the same general purchasing power.<sup>61</sup>

Recoverable amount is described as the current amount of cash that is expected to be recovered from the use or sale of the asset. This implies the use of net realizable value in measuring the current value of assets to be sold.

### The Need for Empirical Research

No single approach to determining current value has been identified as the only one that would meet the objectives of financial reporting. SEC Release No. 190 required the capacity replacement cost of assets be reported by certain companies as a supplement to the conventional historical cost statements. Now, FAS No. 33 has superseded SEC Release No. 190, and requires affected companies to disclose the replacement cost of specific assets on a supplemental basis.

The need for current value information has been demonstrated by many. Net realizable value for fixed assets can provide useful and meaningful financial information for both internal and external users. It provides a market value or cash equivalent which reflects a measurement of the current value of the firm's fixed assets. It represents the amount of cash in current

---

<sup>61</sup>Ibid., par. 22.

dollars that could be obtained through the sale of assets owned. Such information would prove to be invaluable in formulating short-range and long-range plans. From an internal need, management could use such information in their day-to-day decision making. Decisions concerning cash flows and rate of return on assets employed are constantly made. Management must know not only what funds are currently available, but also funds that could be made available in order to evaluate alternative decisions. For example, the rate of return on assets employed is one of the measurements used to evaluate management's performance. Management must then exercise all avenues to maximize this goal. This would include entering as well as exiting new markets, disposing of certain assets, and/or acquiring additional ones. The important point is that these types of decisions are made in most cases based on availability of financing, whether it be internal or external. All alternatives must be examined and evaluated. Net realizable value data would provide information on the current cash equivalency of the assets owned.

Externally, net realizable data is needed by lenders in evaluating risks associated with lending decisions. From an investor's viewpoint, the net income produced and the resulting computation of rate of return on assets would be more realistic since they would include increases and decreases in the current value (net realizable value) of the firm's assets.

Net realizable value has been suggested by many as the current value method of choice. One of the major problems in the use of this method has been the lack of market sale prices for certain types of assets. It is the purpose of this study to empirically test the reliability of specific price indexes in predicting net realizable value for certain types of assets.

The next chapter will provide a more in depth review and analysis of the net realizable value method of accounting.

## Chapter 3

### NET REALIZABLE VALUE AS A MEASURE OF CURRENT VALUE

#### Net Realizable Value: An Exit Value Method

There are two basic market value measurement systems for valuing assets: exit value and entry value. Exit value, often referred to as market value, was defined by the AICPA Study Group as:

A valuation basis quantifying assets and liabilities by the amounts that would be received or paid currently as a result of non-distress liquidation.<sup>1</sup>

In other words, exit value accounting systems are based on valuing assets owned at the amount of cash or other consideration assets would command if disposed of through normal market channels. The entity in this situation is viewed as the seller. In contrast, entry value accounting systems are based on the replacement cost theory; that is, assets owned are valued at their respective replacement or reproduction costs. Here the entity is viewed as a buyer of assets.

---

<sup>1</sup>American Institute of Certified Public Accountants, Objective of Financial Statements, p. 41.



In analyzing each of the various valuation methods, the AICPA Study Group stated the following regarding exit value:

Exit value may be an appropriate substitute for measuring the potential benefit or sacrifice of assets and liabilities expected to be sold or discharged in a relatively short time. For many assets and liabilities, exit values and current replacement costs may be substantially the same. In such cases, the ease and cost of application should be considered. These valuation bases also may be useful for assessing alternative courses of action (opportunity costs). Exit values measure the opportunity to sell assets or discharge liabilities that continue to be held. Current replacement costs measure opportunities foregone.<sup>2</sup>

The theory for this approach is that management has the responsibility to increase the value of net assets which have been entrusted to it by the owners, and the success of management is measured with reference to the increase in the net amounts that might be realized by the assets.<sup>3</sup>

Net realizable value is the amount of cash or generalized purchasing power that each asset owned would generate if disposed of in the open market in an orderly sale. It may be viewed as the current market value (selling price) of the assets held. The term current cash equivalent is often substituted for net realizable value. The reason for this approach is that net realizable value is intended

---

<sup>2</sup>AICPA Study Group, p. 43.

<sup>3</sup>Morley P. Carscallen, "How Financial Reporting Has Responded to Changing Values." Current Value Accounting: A Practical Guide for Business ed. by Warren Chippendale and Phillip L. DeFliese. (AMACOM: New York), p. 35.

to measure the current financial position of an entity based on valuing the cash worth of the assets owned and the cash required to discharge liabilities. The cash equivalent of assets held is based on saleable value the assets themselves possess rather than the replacement cost for similar assets. Saleable value refers to sale price in a normal sale; not to situations such as forced liquidations.

Usefulness and Support for Net  
Realizable Value

R. C. Chambers is probably the leading advocate of the net realizable value method for valuing and reporting accounting data. He contends that non-monetary assets can be assigned monetary values from two prices, buying price (entry value) and selling price (exit value). The selling price allows the firm to go into the market with cash to obtain necessary assets required for adapting to contemporary conditions. He proposes that the only measure uniformly relevant for all future actions is the selling price of the asset which he refers to as the realizable price. He further describes realizable price as the current cash equivalent.<sup>4</sup> With reference to the measurement of financial accounting events in terms of current value, Chambers stated:

Every measurement of a financial property  
for the purpose of choosing a course of action --  
to buy, to hold, or to sell -- is a measurement

---

<sup>4</sup>R. C. Chambers, p. 92.

at a point of time, in the circumstances of the time,<sup>5</sup> and in the units of currency at that time. . . .<sup>5</sup>

Chambers views past prices as irrelevant to future actions and future prices as being just speculation.

Sterling in support of net realizable value and in reference to liquidation in the normal course of events stated:

This dictates the market in which the good would be sold and indicates that some relatively short period of time would be necessary to effect the sale. Although this redefines the problem of determination instead of solving it, these are in fact the values needed by management and entrepreneurs in order to decide whether to continue or liquidate. The reasonable alternatives are between normal liquidation and continuation, not between forced liquidation (by definition, when one is forced to do something, he has no alternative) and continuation.<sup>6</sup>

Investors have entrusted that management of the firm with assets on which they are expecting a certain rate of return. The measurement (valuation basis) of assets affects both the numerator and denominator in computing the rate of return. It seems logical that management should be evaluated based on assets for which it has had custodial responsibility rather than on assets the firm has not purchased. Measuring fixed assets at net realizable value provides a more realistic rate of return, and at the same

---

<sup>5</sup>Ibid., pp. 91-92.

<sup>6</sup>Robert R. Sterling, Theory of the Measurement of Enterprise Income. (Lawrence: University Press of Kansas, 1970) p. 328.

time provides the owners or statement users with the implicit current investment in assets.

Bedford and McKeown viewed the use of net realizable value in measuring current value as providing a better indicator of return on investment. They stated that:

Since the option not to buy is not available, it is not meaningful to attempt to evaluate management by expecting them to earn a particular return on an investment they might now refuse. On the other hand, it is reasonable to expect a certain return on net realizable value--the amount which management refuses to accept in exchange for the assets.

Net income, the numerator in the return on investments computation, should also... be computed using net realizable value measurements of assets. Depreciation would be the difference between beginning and ending net realizable value of the fixed assets over the period. An income would indicate that management made a correct decision at the beginning of the period by holding the assets, since the proceeds from the use of the assets were greater than their decline in value.<sup>7</sup>

From management's point of view, management is being evaluated on the employment of the assets at its disposal. Under the net realizable concept, management will have the necessary information to decide whether to keep or dispose of existing assets in order to fulfill or improve upon the rate of return on the assets, assuming that is one of the corporate goals. This would include knowing the value of assets that could support borrowings or provide the necessary resources to enter new markets or areas. Cash proceeds that could be realized from the sale of fixed

---

<sup>7</sup> Bedford and McKeown, p. 255.

assets can play an important role in the decision-making process for both management and outside owners, investors and creditors. A firm must look at both the short and long-run implications in acquiring, using and disposing of fixed assets.

Additional supporting statements for net realizable value made by Bedford, McKeown and Sterling included the following:

...it becomes possible to review existing plans and make new ones by matching a constantly changing net realizable value against a continuous variety of possible courses of future action.<sup>8</sup>

. . . present exit values must be determined if rational decisions are to be made.<sup>9</sup>

Thus one could contend that net realizable value would be more appropriate for a corporation because stockholders would want to know the amount that could be realized by the corporation and distributed to them through sale of particular assets.<sup>10</sup>

By use of net realizable value management can be motivated to make the more desirable choice among the alternatives currently available.<sup>11</sup>

Although Edwards and Bell saw advantages to using net realizable value, and made a case for using it, they selected entry value (replacement cost) because they viewed a business venture as a going concern and net

---

<sup>8</sup>Norton M. Bedford, p. 145.

<sup>9</sup>Robert R. Sterling, p. 327.

<sup>10</sup>Bedford and McKeown, p. 254.

<sup>11</sup>Ibid., p. 259.

realizable as a liquidation approach.<sup>12</sup> In making a case for net realizable value and refuting the going concern justification of Edwards and Bell, Chambers stated that:

The expectation of an indefinite life does not entail that every operation selected to carry out its functions shall be carried on indefinitely. Nor, consequently, does it entail that every investment in durable good shall continue until their exhaustion. A firm may change the lines in which it deals, the processes it employs, the means it uses, even to the point where its general character differs materially from its initial character.<sup>13</sup>

Bedford and McKeown in their analysis of net realizable value and replacement cost concluded that advantages accrue to both and that both should be used in presenting financial information in annual reports. They defined the net realizable value of an asset as, "... the maximum net amount which can be realized from the disposal of that asset within a short period of time (not a forced sale situation, but long enough to allow disposal of fixed assets through ordinary use of services)."<sup>14</sup>

Since net realizable value is based on providing financial information which connotes the current cash equivalent of the assets owned, it represents the financial position of the entity in terms of estimated cash flows that could be generated from the disposal of assets. One of the

---

<sup>12</sup>Edwards and Bell, pp. 70-109.

<sup>13</sup>R. C. Chambers, p. 203.

<sup>14</sup>Bedford and McKeown, pp. 253-61.

objectives of financial reporting should provide information that users need for predicting and assessing the amounts and timing of prospective cash flows. Another objective directed at internal management pertains to the use and conversion of assets in a manner that is in the best interest of the firm. The values produced under net realizable value accounting may be of extreme importance in fulfilling both of these objectives.

#### Criteria for Net Realizable Value Data

The criteria for evaluating net realizable data are the same as for any other accounting method. As described in Chapter 1, the usefulness criterion is essential and must be supported by the quality characteristics of relevance, timeliness, reliability, verifiability and objectivity.

#### Usefulness

Accounting information reported under net realizable value should be useful to both internal and external users for decision-making. Information that represents the current cash equivalent of assets is needed by internal management in evaluating alternative decisions, such as to exit existing markets and enter new ones; liquidate company debts by borrowing additional funds; issuing stocks or bonds; dispose of nonproductive assets. External users, such as lending institutions, should find the net realizable value

data very useful in evaluating loan decisions and determining the degree of risk involved in making loan decisions. Net realizable value represents the current value of the assets in terms of current dollars that these assets would command in the marketplace through normal disposal procedures. Users can equate to this because this information is in a form which they are accustomed to having.

### Relevance

In order to be relevant, the information reported under the net realizable value method must have some effect or bear upon the decision(s) being made. When utilized by decision-makers the information must be able to influence or make a difference in the decision-making process. With reference to the relevancy of net realizable values, Chambers stated:

Excluding all past prices, there are two prices which could be used to measure the monetary equivalent of any non-monetary good in possession, the buying price and the selling price. But the buying, or replacement price does not indicate capacity, on the basis of present holdings, to go into a market with cash for the purpose of adapting oneself to contemporary conditions, whereas the selling price does. We propose, therefore, that the single financial property which is uniformly relevant at a point of time for all possible future actions in markets is the market selling price or realizable price of any or all goods held.<sup>15</sup>

---

<sup>15</sup>R. C. Chambers, p. 92.



Similarly, Sterling stated that:

The decision requires a selection among alternatives. The total money that could be garnered by the sale of the commodity is the figure that relates these alternatives. The total money is the present sacrifice which the entrepreneur makes in order to obtain or maintain another good. Likewise, the sacrifice is relevant to all receivers for both their instantaneous and intertemporal comparisons. Thus, the present market must be determined before rational decisions can be made. Relevance is a compelling criterion which forces us to reject the previous rationalizations and to begin the task of overcoming the vast difficulties determining current prices.<sup>16</sup>

The net realizable value method reflects current cash values of the assets owned. This represents much needed information regarding potential cash flows that could be generated for use in evaluating decisions both internally and externally.

#### Timeliness

The financial information required by the users must be available when it is needed. Not only must it be available when needed, but also must be relevant. This means the data should be useful in evaluating alternatives and making decisions. Information that represents up-to-date facts and events is considered to be most useful to the users. Net realizable value accounting information represents current data and represents cash values of assets owned in today's dollars; such information is considered timely.

---

<sup>16</sup>Robert R. Sterling, p. 320.

### Reliability

The characteristic of reliability implies that the users can rely on the net realizable value accounting data as representing or reflecting the economic facts and events that it purports to represent. Many users have argued that the data being reported under historical cost are not relevant and reliable. These critics seek data that will reflect current values. Net realizable values determined in any objective way would provide users with reliable financial information.

### Verifiability

Verifiability means that there exists adequate, supportive documentary evidence of the financial transaction and that similar end results would be obtained if two or more qualified individuals examined the data. Net realizable values determined using objective, verifiable procedures will provide users with current value data they need in their decision-making processes. This presupposes that the net realizable value data is useful and relevant, since the verification process only provides assurance that the method used was applied carefully and without personal bias.

### Valuing Assets at Net Realizable Value

Current accounting practice under the historical cost concept makes use of some objective measures for

determining net realizable values for certain assets. In order to develop this idea further, the availability of net realizable values for each of the major asset groups will be discussed in the following sections.

### Current Assets

Since cash is stated in terms of current dollars and purchasing power, there is no need to restate it as it represents net realizable value. Accounts receivable are usually adjusted for an allowance for doubtful accounts and as such are stated at their expected net realizable value. Inventories and short-term investments are normally valued at the lower-of-cost or market. Under net realizable value, the current market prices which are usually readily available produce objective measures for those type assets and could be used for reporting purposes.

### Long-Term Investments

Investments classified as long-term usually have current market price data available. As in the case of short-term investments, these market values represent the current cash equivalent (net realizable value) and are verifiable and objectively determined.

### Fixed Assets

Unlike the question of the valuation of current items, there is often no objective measure of net realizable values for fixed assets (plant, property and

equipment). Use of a non-objective measure, such as appraisals, has been suggested for these types of assets. Although useful current data can result from the appraisal process, this method is disadvantaged because it is subjective, expensive and may be imprecise. There are many outside forces (physical, governmental, social and economic among others) that affect the value of fixed assets. Appraisers must consider all of these in arriving at a market value for a specific piece of property. This is a very difficult and subjective task and similar figures may not always result from a second appraiser.

The search continues for an objective measurement of net realizable value for property, plant and equipment. A used market for cars, trucks and some machinery does exist and may be considered fairly objective in providing net realizable values for these assets. FAS. No. 33 indicates that the current cost of an asset owned may be determined by measuring the current cost of a used asset of the same age and in the same condition as the asset owned.<sup>17</sup> Current cost in this sense would represent net realizable value. In addition FAS No. 33 dictates that assets that are to be sold should be valued at net realizable value.<sup>18</sup>

---

<sup>17</sup>FASB, "Financial Reporting and Changing Prices", par. 58.

<sup>18</sup>Ibid., par. 63.

Arriving at an objective measure of net realizable value for land and buildings is still a problem. These are considered unique-type assets and current market prices (values) of these assets are usually not available. There is a need to develop objective measurements for this type of asset if reliable net realizable financial reports are to be issued. The use of specific price indexes could provide objective measures of net realizable value for buildings. The indexes are objectively determined and the computations of net realizable value are easily verifiable. FAS No. 33 allows the use of specific price indexes to measure the current value of assets owned.

#### Summary

Net realizable value data are useful to users in evaluating alternatives and making decisions. It is not that net realizable value data are more useful than data produced under other current value methods, but that it can play an important role in providing both internal and external users with added information needed in evaluating various alternatives. Bedford and McKeown saw a need for both net realizable value and replacement cost data and concluded that both are useful and should be reported to users of financial information.<sup>19</sup> If net realizable value information is useful, then the information

---

<sup>19</sup>Bedford and McKeown, p. 261.

generated by the accounting system must be relevant, timely, reliable and verifiable. Net realizable data will have to be obtained from more than one source. Unlike historical cost which is primarily based on completed arms-length transactions with supporting documentary evidence, net realizable value will have to rely on other techniques to produce current values of the assets owned. This could include current market prices for similar new assets (inventories), market prices for similar used assets (equipment), and other methods (indexing) that can reasonably estimate net realizable values. This being the case, some degree of objectivity and reliability will have to be given up if useful, relevant, and timely information is to be provided. Given the need for net realizable value data, it is the duty of the accounting profession to identify, develop, test, and establish techniques and procedures that can be used to generate these data.

#### Review of Related Studies

A review of the literature revealed no specific empirical research specifically addressing the subject of this study. However, there have been numerous studies conducted which address, in general terms, the usefulness, objectivity, verifiability and comparability of reporting current value data. Some of these studies will be briefly discussed as a means of demonstrating the need for the

measurement and inclusion of current value information in financial reports.

### Brenner Study

Brenner's study was primarily concerned with whether changes in current value should be included in reported earnings per share.<sup>20</sup> Questionnaires were sent to three user groups as follows: 2,000 to stockholders, 1,000 to bankers and 1,000 to analysts. A second mailing was used to test for possible bias between respondents and non-respondents. The respondents to the questionnaire were to assume that current value earnings per share computations would replace the earnings per share data reported under historical cost.

The results of the study indicated that a majority of the bankers and analysts disagreed with the concept of using current value in computing earnings per share. The stockholder group did not have a majority for or against the current value concept. Brenner stated that "if the sampled groups are representative of their respective populations, the three populations are different to a statistically significant degree." He concluded that the sampled population had different desires for information,

---

<sup>20</sup>Vincent C. Brenner, "Financial Statement Users Views of the Desirability of Reporting Current Cost," The Journal of Accounting Research, 8 (Autumn 1970), pp. 159-66.

and that current value would be useful only if provided on a supplemental basis.

### Garner Study

Garner studied the perceived need for price-level and replacement value data by sending a questionnaire to a sample group consisting of the following: 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.<sup>21</sup>

The purpose of the study was to determine whether financial statements, as currently prepared, provide the information needed by financial statements. Those who replied that financial statements, as currently prepared, do not provide sufficient information for their uses were requested to respond to questions concerning (1) the types of data needed, (2) whether they felt such data could be accurately measured, and (3) the need for presentation of such data in published financial statements.

An analysis of the responses showed that about 60 percent indicated that financial data as currently reported do not satisfy their needs. Twenty-eight percent indicated a need for replacement value for certain assets

---

<sup>21</sup>Donald E. Garner, "The Need for Price-Level and Replacement Value Data," The Journal of Accountancy, 134 (September 1971), pp. 94-98.



and 26 percent indicated a need for price-level adjusted information. The majority felt that such information could be presented in supplementary statements.

More of the respondents supported the ability of accountants to measure replacement value accurately for some assets than for similarly accurate measurement of price-level adjusted information. Also, over a quarter of the polled users believed that the AICPA should take positive action in order to encourage the reporting of price-level and replacement value data.

#### McKeown Study

McKeown tested the applicability of Chambers' model using exit value (net realizable value or current cash equivalents for assets and discounted present value for liabilities).<sup>22</sup> The purpose of the study was to determine if the revised measurements produced by the model would be more objective and provide better information for users of financial statements.

A medium-sized road construction company was used in the study. Multiple linear regression based upon sale prices of similar assets was used as the primary measurement method to value the plant assets. In cases where market resale prices were not available, current cash equivalent was approximated by use of index numbers.

---

<sup>22</sup>James C. McKeown, "An Empirical Test of a Model Proposed by Chambers," The Accounting Review, 1 (January 1971), pp. 12-29.

The results of the study showed that the valuations under the revised measurement methods were more verifiable than measures obtained under generally accepted accounting principles. Also, that the revised measurements showed dispersions which would be acceptable to statement users. He qualified the study by stating that the conclusions arrived at do not prove that the Chambers model is generally applicable in all situations, but that the model was applicable in this particular situation and probably would be applicable to companies similar to the one used in the study.

#### McDonald Study

McDonald's study was aimed at determining the feasibility of using market prices in financial reports.<sup>23</sup> Two versions of a case questionnaire were sent to two randomly selected groups of Certified Public Accountants in California. Each version of the questionnaire described a fleet of automobiles in virtually the same terms.

One group was asked to measure the net realizable value of the fleet at the end of each of four years. This group was also provided with used car prices taken from Kelly Blue Book Market Report and Red Book Official Used Car Valuations, and used car auction prices from Automotive News. The other group was asked to apply generally accepted

---

<sup>23</sup>Daniel L. McDonald, "A Test Application of the Feasibility of Market Based Measures in Accounting," The Journal of Accounting Research, 6 (Spring 1968), pp. 38-49.

accounting principles in selecting a depreciation pattern for the fleet and to estimate the useful life, salvage value and so forth. They were provided with depreciation policies of other fleet owners and the related capital budget analysis that was utilized in making the decision to buy the fleet.

McDonald concluded from his study that the use of current market data results in less disperse measures than those obtained under generally accepted accounting principles.

#### Sterling and Radosevich Study

This study was similar to that performed by McDonald. A questionnaire was sent to 500 randomly selected certified public accountants in the United States. Information on the installment purchase of a ten-key Monroe printing calculator was provided as follows: date of purchase, price, purchase discount, monthly payments and final selling price. The accountants were asked to furnish information on: (1) the depreciation method; (2) capitalized cost; (3) salvage value; and (4) years of life that was best for book value as opposed to tax purposes. They were asked to provide minimum and maximum figures for capitalized cost, salvage value and life to which they would certify. Additionally, they were asked to "take a guess at the fair-market value as of today."<sup>24</sup>

---

<sup>24</sup>Robert R. Sterling and Raymond Radosevich, "A Valuation Experiment," Journal of Accounting Research, 7 (Spring 1969), p. 91.

Mean and variances for both book and market values were computed. The mean of the book values was approximately \$455 and the variance was  $(\$121.07)^2$  or 14,658 while the mean of the market values was about \$441 and the variance was  $(\$179.40)^2$  or 32,184. The means for both book and market values were close, however, the variances were significantly different. Sterling and Radosevich concluded that this indicated that historical cost data are more objective than market value data (based on the lower variance). A point to make about the results is that accountants have had considerable experience in determining and dealing with historical values, but limited experience in estimating market value. It is possible that had they had equal experience, there would be a lower deviation in the current market value estimates.

A comparison of Sterling and Radosevich's study with that performed by McDonald, reveals that although the cases are quite similar, the conclusions reached were completely opposite. An explanation for this could be that the asset chosen by McDonald (fleet of automobiles) had a fairly well established second-hand market, while the ten-key calculator did not.

Similarly, Parker's Study (which follows) also used a printing calculator but revealed an opposite conclusion than that reached by Sterling and Radosevich. The reason being that he (Parker) used a different source to determine the market value of the asset.

### Parker Study

Parker's study involved comparing measures of asset book value under historical cost with exit value (market value) for a particular type of asset.<sup>25</sup> He was specifically testing to determine which of the two valuation methods proved to be more objective and exhibited greater comparability. He selected a six year old printing calculator as the asset on which to conduct the test. He visited 148 business firms dealing in office equipment and asked them to make an offer for the machine. Sixty bonafide bids were received. He surveyed 400 owners of the same make and model machine to obtain book value information. He received 115 useful replies of which 89 were dropped from the analysis, leaving 26 responses in the study. Specific information collected on the questionnaire included original capitalized cost, salvage value, estimated life and depreciation method used.

Parker concluded that:

- (1) Exit values exhibited greater comparability than book values.
- (2) Exit values were more objective than book values.
- (3) The major cause for the lack of objectivity in the book values was dispersion in accounting estimates - not accounting methods.

---

<sup>25</sup>James E. Parker, "Testing Comparability and Objectivity of Exit Value Accounting," The Accounting Review, (July 1975), pp. 512-24.

However, he stated that these findings could not be generalized based on this single study with one asset class, but then stated that serious implications for accounting practice exist.

The adequacy of the experimental design of Parker's study was questioned by Hartman and Zaunbrecher.<sup>26</sup> Their major criticisms were: (1) historical cost values (measurements) were taken from 26 different assets, while all the exit values were taken on the same asset; (2) all the dealers providing the exit value data were located in the same geographical area, while the historical cost data was obtained from owners across the country; and (3) the use of a prior sample design would have been a more appropriate sampling method. They concluded that these criticisms did not invalidate the research, but that the validity of the author's conclusions concerning the objectivity and comparability were questionable.

#### Weiner Study

Weiner's Study dealt with the feasibility of obtaining objective measures of the current value of land

---

<sup>26</sup>Bart P. Hartman and H. C. Zaunbrecher, "Comparability and Objectivity of Exit Value Accounting: A Comment," The Accounting Review, 51 (October 1976), pp. 927-29.

and buildings.<sup>27</sup> His study was limited to the examination and evaluation of appraisal techniques and procedures for measuring current values. Objectivity was viewed in terms of variance or dispersion with high objectivity being measured with little dispersion and vice versa. The study consisted of 625 different properties, each having two appraisals.

Weiner concluded that appraisals appear to be objective measurements with the present differences calculated between appraisals being less than 10 percent approximately 70 percent of the time. However, he stated that appraisals should not be included in financial reports until unwarranted divergencies can be eliminated and a set of standard procedures for both preparing and evaluating appraisals is developed.

#### Gress Study

The objective of Gress's Study was to test the practicality and objectivity of accounting using current replacement costs.<sup>28</sup> A forty year old company with assets of about \$10 million was selected for the study. The balance sheets for years ended December 31, 1968 and 1969,

---

<sup>27</sup>David Peter Weiner, "The Feasibility of Obtaining an Objective Measure of the Current Value of Land and Buildings for Disclosure in Published Financial Statements," (unpublished Ph.D. dissertation, The University of Michigan, 1972).

<sup>28</sup>Edward J. Gress, "Application of Replacement Cost Accounting: A Case Study," ABACUS, 1 (June 1972), pp. 3-12.

were adjusted to a replacement cost basis. The plant and equipment assets were restated using one of the following methods: (1) appraisal, (2) specific price indexes and (3) current cost quotations. Specifically, those assets were restated as follows:

Land - use of appraisal;

Buildings - specific price index for building costs;

Machinery and Equipment - current cost quotations for identical assets;

Automobiles - current replacement cost quotations from dealers; and

Office Furniture and Equipment - current replacement cost from suppliers.

Gress concluded from his study that the application of replacement cost to the company under study was considered successful and done objectively. Also, that both the replacement cost information obtained from suppliers and the specific price indexes compiled by independent parties are verifiable and objective.

#### Summary of Related Studies

The McKeown, McDonald, Parker and Sterling and Radosevich studies examined the feasibility and objectivity of determining net realizable values for certain types of assets. For the most part, the conclusions reached revealed that net realizable values in the individual studies were more objective than the values reported under historical cost. Specific price indexes were used in



estimating market values for certain assets in both the McKeown and Gress studies.

These studies along with others that have been conducted in the area of current value accounting have contributed to the body of knowledge demonstrating the need for and usefulness of current value accounting, as well as the objectivity and usefulness of the net realizable value method. There still exists a need for more research dealing with the measurement of net realizable values. There is specific need for a low cost, objective method of measurement for certain fixed assets where no established second-hand market exists. This study is an attempt to determine if net realizable values for certain types of buildings can be predicted using specific price indexes.

#### Statement of the Problem

As outlined in the first three chapters, the objective of accounting is to communicate useful financial information to both internal and external users. Useful information is described as that which influences and/or enhances the decision-making process of users.

As outlined in the second chapter, there are different methods that may be used to measure the current value of assets. Net realizable value is one such method. The usefulness and need for the reporting of asset net realizable values was discussed in Chapter 2 and again

in this chapter. Although net realizable value for certain assets can be easily determined, a significant problem exists for certain types of assets where current market values are often not available. Such is the case for buildings owned by an entity. There are no used market prices for buildings; therefore, there is need for an objective method of measuring the net realizable value of buildings. Since specific price indexes are objectively determined and easily accessible and verifiable, they could provide objective measures of net realizable values for buildings owned by an entity.

To date, there has been little, if any, research dealing with testing the predictability of specific price indexes in determining the net realizable value of plant assets. This study provides for testing of the reliability of specific index numbers in predicting net realizable value for certain types of buildings (office, warehouse and general all-purpose buildings). The development of procedures and techniques, such as using specific index numbers, to measure net realizable values is needed. Communication of relevant financial information to internal and external users is the objective of accounting and financial reporting. The reporting of net realizable values can contribute toward the achievement of this objective.

## Chapter 4

### RESEARCH METHODOLOGY

In the initial phase of the study, the research problem was identified as the lack of an objective measurement method for measuring the net realizable value for certain types of assets, such as buildings, for which no current used market value is readily available. The purpose of the study is to empirically test the reliability of specific index numbers in predicting the net realizable value for certain types of buildings. This chapter presents the research methodology used in this study.

#### Data

The data used in this study originated from two sources; published indexes and a survey instrument.

#### Published Indexes

This study includes five specific price indexes which are primarily concerned with costs or expenditures for the construction of buildings. There are three distinct sources of the five indexes: Boeckh Indexes,<sup>1</sup> Engineering

---

<sup>1</sup>U.S. Department of Commerce, "Current Business Statistics--Construction and Real Estate/Construction Cost

News-Record,<sup>2</sup> and the Gross National Product-Implicit Price Deflator Index.<sup>3</sup> E. H. Boeckh and Associates, Inc. produce three separate construction cost indexes. Two of them: (i) Apartments, hotels and office buildings, and (ii) Commercial and factory buildings are used in this study. The Engineering News-Record publishes two separate construction cost indexes: (i) Building, and (ii) Construction. Both are used in the study. The Gross National Product Implicit Price Deflator Index contains several specific indexes, one of which is the gross private investment in non-residential structures. This specific index is used in this study. All of the indexes used in this study are published by the U.S. Department of Commerce.

Boeckh Indexes. The Boeckh Indexes are constructed by the American Appraisal Company which uses an arithmetic

---

Indexes," Survey of Current Business, February issues 1959-1981.

\_\_\_\_\_. "Construction and Real Estate--Construction Cost Indexes and Construction Materials," Business Statistics (The Biennial Supplement to the Survey of Current Business), 1967, p. 51, 1973, p. 55.

\_\_\_\_\_. "1963 Statistical Supplement to the Survey of Current Business--Construction and Real Estate--Construction Cost Indexes and Construction Materials," Business Statistics 1963 Edition, p. 50.

\_\_\_\_\_. "1979 Statistical Supplement to the Survey of Current Business--Construction and Real Estate--Construction Cost Indexes and Construction Materials," Business Statistics 1979 Edition, p. 46.

<sup>2</sup>Ibid.

<sup>3</sup>Department of Commerce, "GNP Implicit Price Deflator," Survey of Current Business, Quarterly issues 1959-1981.

average of construction indexes for 20 major pricing areas (metropolitan areas). Basic materials (which are included in the construction indexes) are obtained from local building materials dealers and include prices of brick, common lumber, portland cement, structural steel, heating and plumbing equipment, paint, glass and hardware. Labor costs are obtained primarily from contractors and building-trade associations. Their costs represent prevailing wage rates and include both common and skilled labor rates.

The published Boeckh Indexes are: (1) an index for apartments, hotels, and office buildings, (2) an index for commercial and factory buildings and (3) an index for residences. The first two are used in this study since they pertain to office buildings and warehouses, the type of buildings that are included in the study.

Engineering-News Record Indexes. Engineering News-Record publishes two specific indexes. Construction Cost Index and Building Cost Index. Both indexes are made up of four components: labor and three material items (base price of structural steel and consumer's net price of cement, and lumber). The labor component for the Construction Cost Index is the common labor (Engineering News-Record 20-city average), while the labor component of the Building Cost Index is the 20-city average for skilled labor.

Gross National Product-Implicit Price Deflator Index. The implicit price deflator (IPD) is the price index for the

Gross National Product (GNP). It represents the ratio of GNP in current prices to GNP in constant prices. It is a weighted average of the price indexes used to deflate the components of GNP, the implicit weights used being expenditures in the current period. All expenditures are valued in prices of the base year. Comparison of the IPD with its base provides a measure of pure price change for that time period based on fixed, current-period weights. The IPD for gross private domestic fixed investments in non-residential structures is used in the study.

#### Surveyed Data

The second source of data was obtained through the use of a mail survey instrument which was sent to the 1,000 largest publicly held companies in the United States in 1980 as listed in the May 1981 issue of Fortune magazine. The mail survey method was selected because it can reach many companies over a large geographical area. Also, because a large population can be surveyed, there is a wide dispersion of responses and a greater assurance that sufficient, usable data will be collected.

Population sample. The top 1,000 non-financial corporations of 1980 were chosen for the sample because they are the ones which may be expected to be most affected by the recent current value disclosure requirement of FAS No. 33. Also, they would be the companies most likely to have the type of information requested in the survey which probably enhanced

the response and participation rate. The data collection forms were mailed to financial vice-presidents or controllers of the 1,000 companies.

The data and the data collection form. The data requested from the sample firms pertained to transaction costs on as many as six industrial or commercial properties (buildings) that had been acquired and subsequently sold. Companies that could provide more than six transactions were encouraged to do so. The requested data was limited to warehouse, office and general purpose buildings that were operational assets acquired after 1958, held for at least three years, and then sold. To qualify as an acceptable transaction, there must have been both an entry (acquisition cost) and an exit (selling price) value available for each building. The entry value was either the purchase price for an existing building or the construction cost for a new building. The exit value was limited to cases involving outright sales only.

The data requested for each building transaction included the following: date of acquisition, acquisition cost, estimated useful life, capitalized cost of addition(s), date(s) of addition(s), date of sale, selling price, location of property (state) and type of building. Although data for buildings with capitalized additions were collected, they were excluded from the study. These data were collected for two reasons, (1) to provide some assurance that only buildings

without additions were included in the study, and (2) to provide for future research in this area using the data that included additions.

Also, the companies were asked to disclose how building purchase cost and subsequent sales price were allocated between land and building. The data were included in the study if either an appraisal or market value method was used; otherwise, the data were excluded because generally accepted accounting principles were not followed in accounting for the assets. The Appendix includes both a copy of the cover letter and the data collection form sent to each company.

In the study, the acquisition cost is denoted as the historical cost value, and the sales price is denoted as the net realizable value. The relationship between the net realizable value and historical cost is established with various specific price indexes.

### Experimental Design

The purpose of the study was to determine:

(1) Whether a model using a specific price index or combination of indexes can predict the relationship between net realizable value and historical cost (where historical cost is the purchase price or construction cost); and/or

(2) Whether a model using a specific price index or combination of indexes can predict the relationship between net realizable value and historical cost (where historical as noted in (1) is adjusted for depreciation).



Using ordinary least square regression to test for the "best" index or combination of indexes, all possible regressions were performed on 71 percent of the usable property data collected. The remaining 29 percent of the data was retained as a holdout sample for performing tests on the model. The regression equations were run and tested at Louisiana State University on the System Network Computer Center IBM 3033 using the Statistical Analysis System (SAS79) designed and implemented by the SAS Institute.<sup>4</sup>

The simple linear regression equations where historical cost is not adjusted for depreciation are stated as:

$$\frac{SP_{t=i} - HC_{t=j}}{HC_{t=j}} = b_0 + b_1 \frac{BO_{1,t=i} - BO_{1,t=j}}{BO_{1,t=j}} ; \quad (1)$$

$$\frac{SP_{t=i} - HC_{t=j}}{HC_{t=j}} = b_0 + b_2 \frac{BO_{2,t=i} - BO_{2,t=j}}{BO_{2,t=j}} ; \quad (2)$$

$$\frac{SP_{t=i} - HC_{t=j}}{HC_{t=j}} = b_0 + b_3 \frac{EN_{1,t=i} - EN_{1,t=j}}{EN_{1,t=j}} ; \quad (3)$$

$$\frac{SP_{t=i} - HC_{t=j}}{HC_{t=j}} = b_0 + b_4 \frac{EN_{2,t=i} - EN_{2,t=j}}{EN_{2,t=j}} ; \quad (4)$$

$$\frac{SP_{t=i} - HC_{t=j}}{HC_{t=j}} = b_0 + b_5 \frac{GNP_{t=i} - GNP_{t=j}}{GNP_{t=j}} ; \quad (5)$$

where

SP = actual selling price;

HC = historical cost;

---

<sup>4</sup>SAS Institute, Inc., A User's Guide-1979 Edition (Cary, North Carolina, 1979).

$BO_1$  = Boeckh Index for apartments, hotels and office buildings;

$BO_2$  = Boeckh Index for commercial and factory buildings;

$EN_1$  = Engineering News-Record Index for buildings;

$EN_2$  = Engineering News-Record Index for construction;

$GNP$  = Gross National Product-Implicit Price Deflator Index for gross private domestic fixed investment in non-residential structures;

$b_0$  and  $b_k$  = the estimate parameters; where  $k$  takes on a value of 1 through 5 corresponding to the specific price indexes;

$t=i$  = date of sale; and

$t=j$  = date of acquisition.

The multiple regressions comprise all possible combinations of the variables found in the simple linear equations (1) through (5). One example using two independent variables is:

$$\frac{SP_{t=i} - HC_{t=j}}{HC_{t=j}} = b_0 + b_1 \frac{BO_{1,t=i} - BO_{1,t=j}}{BO_{1,t=j}} + b_2 \frac{EN_{1,t=i} - EN_{1,t=j}}{EN_{1,t=j}} \quad (6)$$

The regression model in general terms is stated as:

$$Y = b_0 + b_1 X_1 + \dots + b_k X_k + \tilde{e} \quad (7)$$

where

$$Y = \frac{SP_{t=i} - HC_{t=j}}{HC_{t=j}};$$

$$X_1 = \frac{BO_{1,t=i} - BO_{1,t=j}}{BO_{1,t=j}};$$

$$X_2 = \frac{BO_{2,t=i} - BO_{2,t=j}}{B_{2,t=j}};$$

$$X_3 = \frac{EN_{1,t=i} - EN_{1,t=j}}{EN_{1,t=j}};$$

$$X_4 = \frac{EN_{2,t=i} - EN_{2,t=j}}{EN_{2,t=j}};$$

$$X_5 = \frac{GNP_{t=i} - GNP_{t=j}}{GNP_{t=j}};$$

$b_k$  = the estimate parameters; where k takes on subscript of 0 through 5 corresponding to the intercept term and the specific indexes; and

$\epsilon$  = random error.

$Y$  takes on a different value ( $Y_1$ ) when historical cost (HC) is adjusted for depreciation; denoted as HCA; that is:

$$Y_1 = \frac{SP_{t=i} - HCA_{t=j}}{HCA_{t=j}}.$$

Given the problem and purpose of the research, the hypotheses tested are:

H01: There is no statistically significant relationship between the percent change as measured from the date of purchase to date of sale of net realizable value to unadjusted (before depreciation) historical cost and the percent change measured for the same time period in a specific price index or combination of indexes; and

H02: There is no statistically significant relationship between the percent change as measured from the date of purchase to date of sale of net realizable value to adjusted (after depreciation) historical cost and the percent change measured for the same time period in a specific price index or combination of indexes.

If either or both of these hypotheses is rejected, the conclusion can be made that within the parameters of the

study, a specific price index or combination of specific indexes can be used to predict net realizable value (selling price) for certain types of buildings. The effect, if any, of the depreciation component included in the test will also be established. Rejecting either or both of the hypotheses will establish, within the parameters of the study, an objective, verifiable and relatively inexpensive method for predicting net realizable value of certain buildings which should be useful for both internal and external reporting purposes.

If neither  $H_{01}$  nor  $H_{02}$  are rejected, the conclusions can be made that within the parameters of the study a specific price index or combination of indexes does not produce an acceptable method for predicting the net realizable value of certain types of buildings.

Model acceptance will be based on the Student's t-test at the 5 percent level of confidence for the parameter estimates. The t-test is used to determine which parameters (independent variables) contribute significantly in explaining the dependent variable. Significance is measured at the 5 percent level of confidence. The appropriate hypothesis for each k subscript test is:

$$H_0 : B_k = 0.$$

If the null hypothesis is not rejected for all the dependent variables at the 5 percent level, then the conclusion can be made that the model does not contribute significantly in explaining Y. If the null is rejected for

all parameters, then it will be concluded that the model does contribute significantly at the 5 percent level in explaining Y.

Other criteria that are used in evaluating each model are:

- (1) the value of the estimated mean square error (MSE);
- (2) the value of R-square ( $R^2$ ); and
- (3) the value of the F-test.

Thus, a statistically acceptable model will be one which has all of its parameter estimates significantly different from zero. The closer the estimates are to zero the less they contribute toward explaining Y. MSE is an estimate of the variance of the true residuals. A low MSE means that a significant amount of the variability in the dependent variable is explained by the independent variables in the model. R-square measures how much variation in the dependent variable is explained by the model. The variation can range from 0 to 1, and results from the ratio of the sum of square for the model divided by the sum of squares for the corrected total. Generally, the larger the  $R^2$ , the better the model. The F value tests how well the model as a whole accounts for the dependent variable. It is obtained by dividing the mean square for the model by the mean square for error. A large ratio indicates that the model is accounting for the dependent variable's behavior. Obviously, it is possible that more than one model could

meet the acceptability tests. In that event, the predictive ability of the qualifying models are tested using the holdout sample.

The predictive model is stated as:

$$\hat{SP}_{t=i} = HC_{t=j} + [HC_{t=j} (\hat{b}_0 + \hat{b}_1 X_1 + \dots + \hat{b}_k X_k)] \quad (8)$$

where

$\hat{SP}_{t=i}$  = the estimated net realizable value;

$HC_{t=j}$  = the historical cost from the holdout sample; and

$k$  and  $\hat{b}$  = parameter estimates of  $b_k$  which is determined from the regression model.

To determine which model is more predictive, a Friedman two-way analysis of variance is used.<sup>5</sup> This test is used to determine if any one model is significantly better than all the others. The test is performed to determine if there is any variability among subjects in the same group and provides the ability to detect group differences in the variables of interest by dividing the subjects into homogeneous subgroups. In the test, the data are arranged by "block" (rows) and "treatment" (columns) as demonstrated in Table 1 taken from Friedman. Blocks represent the observations (buildings in this study) and treatments represent the results of each model (percent difference between actual selling price and predicted selling price in this study).

---

<sup>5</sup>Wayne W. Daniel, *Applied Nonparametric Statistics*, (Houghton Mifflin Company: Boston, Massachusetts, 1978), pp. 224-31.

Table 1  
Data Display for the Friedman Two-Way Analysis  
of Variance by Rank<sup>6</sup>

Block	Treatment						
	1	2	3	...	j	...	k
1	$X_{11}$	$X_{12}$	$X_{13}$	...	$X_{1j}$	...	$X_{1k}$
2	$X_{21}$	$X_{22}$	$X_{23}$	...	$X_{2j}$	...	$X_{2k}$
3	$X_{31}$	$X_{32}$	$X_{33}$	...	$X_{3j}$	...	$X_{3k}$
.							
.							
.							
i	$X_{i1}$	$X_{i2}$	$X_{i3}$	...	$X_{ij}$	...	$X_{ik}$
.							
.							
.							
b	$X_{b1}$	$X_{b2}$	$X_{b3}$	...	$X_{bj}$	...	$X_{bk}$

There are  $b$  mutually independent samples (blocks) of size  $k$ . Observation  $X_{ij}$  is the  $j$ th observation in the  $i$ th sample (block).

The objective of the Friedman test is to determine whether there is a difference among treatments. The hypotheses tested are stated as:

$H_0$ : The populations within the blocks (buildings) are identical.

$H_1$ : At least one treatment (model) tends to yield larger values than one other treatment (model).

<sup>6</sup>Ibid. p. 224.

In calculating, Friedman's "test statistic", the treatments for each block are ranked separately from the smallest to the largest resulting in multiple ranks for each treatment. The rankings for each treatment are then summed.

The computational formula for the "test statistic" is stated as:

$$X_r^2 = \frac{12}{c_v(k+1)} \sum_{j=1}^k R_j^2 - 3c(k+1) \quad (23)$$

where

$X_r^2$  = computed value used to compare with tabulated value for significance;

$c$  = number of buildings (blocks);

$v$  = number of models (treatments);

$k$  = number of treatments; and

$R_j$  = the sum of the rankings in the  $j$ th column.

To test for model differences, the absolute percent difference between the actual selling price of each building and its predicted selling price (estimated by each model) is used. The absolute difference is used because in this study closeness to the actual selling price, whether above or below, determines the predictability of the model. Therefore, the signs are ignored in the analysis.

#### Limitations of the Data Collection

The scope of the research project is restricted in several ways. It is limited to certain industrial and commercial building transactions in large publicly-owned



corporations which were listed in 1981 in Fortune magazine. Specifically, the study is limited to warehouse, office and general purpose buildings that were operational assets acquired after 1958, held for at least three years, and then sold. These type of buildings were selected because their acquisition and disposal are most likely to include the building only; that is, equipment and/or machinery would not be part of the transaction, as is the case with factory type buildings. Also a three year ownership period was selected in order to obtain entry and exit values that were separated by a sufficient amount of time to allow for significant changes in the specific price indexes.

Properties that were disposed of other than through outright sales were not included in the study because the disposal value may not have been objective. Further, the model tested only buildings with entry and exit values and it did not allow for the inclusion of capitalized additions to the building. Therefore, buildings that had capitalized improvements during the ownership period were not included in this study.

The top 1,000 companies as listed in Fortune magazine were surveyed because they are the ones most likely affected by the reporting requirements of FAS No. 33, and consequently would probably be acquainted with the problems associated with measuring current values, and may be interested in this particular research project. Further, they would probably

have the largest number of building transactions required by the study, thus enhancing the response rate.

Finally, the survey instrument itself incorporates certain limitations which are inherent in this method of data collection. These include: clarity of the data collection form; proper interpretation of the request by the respondent; surveyer must accept the data submitted, that is, there is no way to verify the data.

#### Summary

The need for and usefulness of net realizable data for internal planning and analysis, as well as reporting to external users for decision making, was established in the prior chapters.

This chapter has identified the research problem as the lack of an objective method for measuring the net realizable value for assets such as buildings, which do not have a current used market readily available. The purpose of the study is to empirically test the reliability of specific index numbers in producing the net realizable value (selling price) for certain type of buildings.

The experimental design utilizing ordinary least square regression is delineated. Both linear and multiple regression equations are presented, in addition to the general regression model.

The Student's t-test, mean square error, R-square and F-test are used in testing for a model(s) that meets the 5 percent level of significance. The hypotheses tested are identified and presented in null form.

The data sources, specific price indexes used and the form of the raw data collected from the top 1,000 companies via a survey instrument are described. The relationship of percent change in the various indexes is established with the percent change from selling price to historical cost for each building. This relationship is tested to evaluate the predictive ability of all possible regressions that are performed.

Finally, the limitations of the survey instrument and the data are presented.

## Chapter 5

### THE DATA AND DATA ANALYSIS

This chapter presents (1) the characteristics of the data sample (mail out, responses, and demographics of the data), (2) a description and explanation of the regression model used, (3) the results of the ordinary least square regressions and additional tests performed, and (4) the results of the prediction models.

#### The Mail Out, Responses and Data Characteristics

The data collection forms were mailed on February 16, 1982 to the top 1,000 publicly held companies in 1980 as listed in the May, 1981 Fortune magazine. The cut-off date for all responses was April 30, 1982. This allowed the respondents over two months to reply from the date of the original mailing. Six survey forms have been returned since the April 30, 1982 cut-off date. All six responses had no data. As a result, the arbitrarily selected cut-off date did not exclude any late data.

Of the 1,000 survey forms mailed, 257 (25.7 percent) were returned by April 30. Seventy-six (29.6 percent) of the responses contained data on 162 buildings. Fifty-four

(71.1 percent) of the 76 responses contained usable data on 101 buildings (See Table 2). Data on 61 buildings were excluded from the study for the following reasons:

- 1) 20 buildings included capitalized additions;
- 2) data were reported for 30 buildings, such as service stations and factories, which were not part of this study;
- 3) five buildings that were sold in late 1981 and early 1982 were dropped because the specific price indexes used in the study were not available beyond mid-1981; and
- 4) six buildings were dropped for other reasons, such as the transaction included price of land and building, buildings were located in a foreign country, and data submitted were incomplete.

One-hundred and fifty companies returned the survey forms with no data. These companies stated that, (1) they had not bought and sold buildings of the kind requested during the time period requested, (2) they did not own any of the buildings requested and/or (3) the buildings were leased.

Table 2  
Responses of Survey Instrument

Type	<u>Responses</u>		<u>Properties Reported</u>		
	Number	%	Usable	Not Usable	Total
Responses with data	76	29.6	101	61	162
Responses with no data available	150	58.4	--	--	--
Responses from companies that could not participate	31	12.1	--	--	--
Total	257	100.1	101	61	162

Thirty-one companies stated that they could not provide data for the study. Some of the reasons given for not providing the data included the following:

We simply do not have the time to devote to answering questionnaires of this nature which come to us from business schools such as yours at the rate of one to two a week.

Sorry, we do not disclose this type of information.

We have established a policy of not responding to questionnaires other than those received from a government agency requiring completion by law.

Since most of the accounting functions are decentralized at the divisions, I do not have access to the detail fixed asset ledgers.

Although we have a policy of encouraging educational research, time constraints and the possible confidentiality of the information requested limit our responses to readily available public documentation.

After collecting and tabulating the responses from the survey forms, the usable data were coded on computer forms and keypunched. Selected frequencies of the data were processed. Table 3 is a frequency of the usable properties by location (state) and type of building. The

Table 3  
Demographics of Data

State	Number of Buildings By Type				Total
	Office	Warehouse	All Purpose	Utility	
(1) Alabama	2	-	-	-	2
(2) Arkansas	1	-	-	-	1
(3) California	10	9	-	1	20
(4) Colorado	-	-	1	-	1
(5) Florida	1	1	-	-	2
(6) Georgia	1	3	-	-	4
(7) Illinois	7	2	2	-	11
(8) Kansas	1	1	1	-	3
(9) Kentucky	-	2	-	-	2
(10) Mass.	-	1	-	-	1
(11) Maine	-	1	-	-	1
(12) Michigan	3	1	-	-	4
(13) Minnesota	2	4	-	-	6
(14) New Hamp.	1	1	-	-	2
(15) New Jersey	-	2	-	-	2
(16) New York	5	6	-	-	11
(17) Ohio	-	2	-	-	2
(18) Oklahoma	-	1	-	-	1
(19) Pennsylvania	4	6	-	1	11
(20) Tennessee	3	1	-	-	4
(21) Texas	3	3	-	-	6
(22) Virginia	2	-	-	-	2
(23) Wisconsin	2	-	-	-	2
Total	48	47	4	2	101
% of Total	47.5	46.5	4.0	2.0	100.0

usable properties were located in 23 states, with California having the largest number (20), followed by Illinois, New York and Pennsylvania with 11 each. Office and warehouse buildings accounted for 94.0 percent of the usable properties, with offices making up 47.5 percent and warehouses 46.5 percent of the total.

Table 4 is a frequency of the usable properties by year of acquisition and year of sale. The 101 buildings

Table 4

Distribution of Usable Properties (Buildings)  
By Year of Acquisition and Year of Sale

Year Acq.	Year Sold									Total	Avg. # Years Held
	1973	1974	1975	1976	1977	1978	1979	1980	1981		
1959						3		1		4	19.5
1960					1	2	3			6	18.3
1961			1			2	1			4	16.5
1963							1		2	3	17.3
1964				1		2	2			5	14.0
1965						1		2		3	14.3
1966		1		1	1	1	3		1	8	11.9
1967					2	1	3	1		7	10.0
1968					1			2		3	10.0
1969	1									1	4.0
1970				2			1	3	3	9	8.7
1971					2		1	1	2	6	7.2
1972							2	4	4	10	7.5
1973					2		2	2	1	7	6.4
1974						1		5		6	5.7
1975						1	2	3	1	7	4.6
1976							3	2		5	3.4
1977								2	4	6	3.7
1978									1	1	3.0
<b>Total</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>9</b>	<b>14</b>	<b>24</b>	<b>28</b>	<b>19</b>	<b>101</b>	<b>9.9</b>
<b>% of Total</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>4.0</b>	<b>8.9</b>	<b>13.9</b>	<b>23.8</b>	<b>27.7</b>	<b>18.8</b>	<b>100.1</b>	



were acquired over a 20 year period ranging from 1959 through 1978. Forty-four buildings were acquired during the period 1959-1969, and the remainder, 57, were acquired in the period 1970-1978. The 101 buildings were sold over a nine year period ranging from 1973 through 1981. The average ownership period for the entire sample was 9.9 years.

Table 5 shows minimum, maximum and mean values for acquisition cost, selling price, and depreciable life of buildings in years. The acquisition cost of the 101 buildings ranged from a low of \$3,210 to a high of \$1,882,038 with an average cost of \$342,494. Selling price, on the other hand, had a minimum value of \$1,200, a maximum value of \$3,333,000 and a mean of \$448,454. The depreciable life of the buildings ranged from 16 to 50 years, with an average of 28 years.

Table 5  
Minimum and Maximum Values of the Usable  
Properties (Buildings)

	Minimum	Maximum	Mean
Acquisition Cost	\$ 3,210	\$ 1,882,038	\$ 342,494
Selling Price	\$ 1,200	\$ 3,333,000	\$ 448,454
Life (Years)	16	50	28

The 101 buildings were broken down into two groups: (1) those (79 buildings) that were used in testing the regression model (shown in Table 6), and (2) those (29 buildings) that were retained as a holdout sample for testing the model(s) (shown in Table 7).

Table 6

Distribution of Properties (Buildings) Included in Developing Models by Year of Acquisition and Year of Sale

Year Acquired	Year Sold								Total
	1973	1974	1975	1976	1977	1978	1979	1980	
1959						3		1	4*
1960					1	2	3		6*
1961			1			2	1		4*
1963							1		1*
1964				1		2	2		5*
1965						1			1*
1966		1		1	1	1	3		7*
1967					2	1	3	1	7*
1968					1			2	3*
1969	1								1*
1970				2			1	2	5
1971					2		1		3
1972							2	4	6
1973					2		2	1	5
1974						1		4	5
1975						1	2	1	4
1976							3	1	4
1977								1	1
<b>Total</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>9</b>	<b>14</b>	<b>24</b>	<b>18</b>	<b>72</b>

\*Denotes the 39 buildings included in the population used to develop "long-term" models; the remainder, 33 buildings, were included in the population used to develop "short-term" models. The use of the "long-term" and "short-term" models is discussed later in the chapter.

About 25 percent (or 25 buildings) of the usable buildings was originally selected as the appropriate number to be included in the holdout sample, and that the holdout sample would consist of the most recent sales. The reason for including the most recent sales is that any model developed will be used to predict the future; that is, events that will occur. The most recent sales reflect the closest transactions to the future and would be impacted by current market and economic conditions.

Table 7

Distribution of Properties (Buildings) Included  
in Holdout Sample by Year of Acquisition  
and Year of Sale

Year Acquired	Year Sold		Total
	1980	1981	
1963		2	2
1965	2		2
1966		1	1
1970	1	3	4*
1971	1	2	3*
1972		4	4*
1973	1	1	2*
1974	1		1*
1975	2	1	3*
1976	1		1*
1977	1	4	5*
1978		1	1*
<b>Total</b>	<b>10</b>	<b>19</b>	<b>29</b>

\*Buildings acquired after 1969 (total of 24).

Working back from the most recent sales transactions, which occurred in the first quarter of 1981, a total of 29 sales were made during the last quarter of 1980 and the first quarter of 1981. These 29 buildings were then selected as the holdout sample, and the remaining 72 were included in estimating the parameters of the models.

### The Regression Model

Ordinary least squares regression was performed to estimate the parameters of the five independent variables. An all possible combination of the variables approach was taken resulting in thirty-one regression models. The models included five simple and twenty-six multiple regressions. For clarity and explanation purposes, the general regression model established in Chapter 4 is restated as:

$$Y = b_0 + b_1 X_1 + \dots + b_k X_k + \tilde{e} \quad (9)$$

where

$$Y = \frac{SP_{t=i} - HC_{t=j}}{HC_{t=j}};$$

$$X_1 = \frac{BO_{1,t=i} - BO_{1,t=j}}{BO_{1,t=j}};$$

$$X_2 = \frac{BO_{2,t=i} - BO_{2,t=j}}{BO_{2,t=j}};$$

$$X_3 = \frac{EN_{1,t=i} - EN_{1,t=j}}{EN_{1,t=j}};$$

$$X_4 = \frac{EN_{2,t=i} - EN_{2,t=j}}{EN_{2,t=j}};$$

$$X_5 = \frac{GNP_{t=i} - GNP_{t=j}}{GNP_{t=j}};$$

$b_k$  = the estimate parameters; where k takes on a subscript of 0 through 5 corresponding to the intercept term and the specific indexes; and

$\tilde{e}$  = random error.

When historical cost (HC) is adjusted for depreciation, it is relabeled as HCA. As a result of this modification, Y takes on a different value and is denoted as  $Y_1$ ; that is,

$$Y_1 = \frac{SP_{t=i} - HCA_{t=j}}{HCA_{t=j}}.$$

### Results of the Tests

By individually examining the T statistics of the parameters for the 62 models (31 models with Y and 31 models with  $Y_1$ ), only one model had results that were statistically significant at the 5 percent level. The single model, which is labeled as Model A, appears in Table 8. In equation form, the model is

$$Y = b_0 + b_1 X_1 + b_2 X_2 + b_5 X_5. \quad (10)$$

Table 8  
Multiple Regression Results  
Model A

Variable Results				Model Results			
Variables	$b_1$	Std. Error of Estimate	$PR >  T $	Mean Square Error	$R^2$	F	$PR > F$
Constant	-0.07863	0.13078	0.5536	.2073	.107	2.71	0.0507
BO <sub>1</sub>	8.00763	3.50739	0.0256				
BO <sub>2</sub>	-9.08329	3.81691	0.0201				
GNP	1.64140	0.61410	0.0094				

Because this study is concerned with predicting net realizable value (or selling price) for certain types of buildings, Model A is restated in terms of selling price. More precisely, the restated model is:

$$\hat{SP}_{t=i,p} = HC_{t=j,p} + [HC_{t=j}(-0.07863 + 8.00763X_1 - 9.08329X_2 + 1.64140X_5)] \quad (11)$$

where

$\hat{SP}_{t=i}$  = the estimated net realizable value for each building in the holdout sample;

$HC_{t=j}$  = the historical cost for each building in the holdout sample;

$X_1$  = percent change in Boeckh Index for apartments, hotels and office buildings;

$X_2$  = percent change in the Boeckh Index for commercial and factory buildings;

$X_5$  = percent change in the Gross National Product Implicit Price Deflator Index for gross private domestic fixed investment in non-residential structures; and

$p$  = the  $p^{\text{th}}$  building.

Equation (11) was then used to predict the selling prices for the holdout sample. These estimated values in dollars and percentages, as well as their deviations from the actual values, are presented in Table 9. The data show that the total absolute difference between actual selling price for the 29 buildings was \$3,670,207, with a range of \$1,754 to \$1,204,099. The percent differences are more meaningful in that they assign equal weight to each building. The overall percent difference for the 29 buildings was 29.7 percent, with the range being from 4.0 percent to 230.1 percent.

Although the model was the only one that met the 5 percent level of confidence and had the highest  $R^2$ , lowest MSE and most significant F-test, its acceptability as a predictor is questionable. This is based on the wide variance between the predicted net realizable and the actual net realizable value for the 29 buildings tested.

The analysis did produce a model within the parameters established; however, because of its questionable usefulness as a predictive tool, additional testing was conducted.

Table 9

Predicted Selling Price and Percentage Relationship in Absolute Terms  
Twenty-Nine Buildings in the Holdout Sample

Model A

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SPC	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
1	70.6	23.4	\$1,160,000	\$ 838,781	\$ 321,219	27.7
2	159.0	50.9	99,287	58,180	41,647	41.9
3	118.7	39.7	3,333,000	2,128,901	1,204,099	36.1
4	5.4	35.2	54,545	77,964	23,419	42.9
5	26.3	34.3	8,000	14,575	6,575	82.2
6	95.5	34.8	30,300	20,899	9,401	31.0
7	52.2	57.9	18,900	62,389	43,489	230.1
8	102.5	59.0	8,160	6,406	1,754	21.5
9	48.0	28.4	27,200	67,227	40,027	147.2
10	62.6	16.6	1,200	3,743	2,543	211.9
11	55.2	12.7	484,375	351,786	132,589	27.4
12	44.8	22.2	2,030,000	1,713,620	316,380	15.6
13	92.4	23.3	1,940,560	1,243,242	697,318	35.9
14	41.6	9.0	84,490	65,023	19,467	23.0
15	30.1	10.0	15,645	24,584	8,939	57.1
16	30.0	16.9	64,568	107,795	43,227	67.0
17	17.2	25.1	9,750	14,735	4,985	51.1
18	10.0	20.7	58,330	78,014	19,684	33.8
19	15.7	8.8	47,600	61,449	13,849	29.1
20	16.0	43.0	209,775	357,187	147,412	70.3



Table 9 (continued)

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
21	2.3	8.8	\$1,195,600	\$1,271,801	\$ 76,201	6.4
22	41.9	14.6	9,728	19,169	9,441	97.1
23	18.8	12.5	54,723	75,768	21,045	38.5
24	37.1	12.5	54,756	98,020	43,264	79.0
25	72.2	9.4	986,496	626,465	360,031	36.5
26	11.8	14.2	67,237	87,037	19,800	29.5
27	66.2	11.1	32,640	21,819	10,821	33.2
28	47.7	3.9	26,040	47,902	21,862	84.0
29	21.9	17.0	241,765	232,046	9,719	4.0
<b>TOTAL</b>			<u>\$12,354,670</u>	<u>\$9,776,527</u>	<u>\$3,670,207</u>	<u>29.7</u>

<sup>a</sup>PCSP-HC is the percent obtained when actual selling price is divided by actual historical cost.

<sup>b</sup>Predicted PCSP-HC is the percent obtained when the predicted selling price is divided by actual historical cost.

<sup>c</sup>Actual SP is the actual selling price of the buildings.

<sup>d</sup>Predicted SP is the predicted selling prices of the buildings as produced by the regression model.

<sup>e</sup>Difference between (c) and (d).

<sup>f</sup>Obtained by dividing (e) by (c).

### Additional Testing

In order to assert the overall stability of the parameter estimates in Model A, the data used in developing the prediction model (72 buildings) were divided into two groups according to dates of acquisition. All of the buildings acquired prior to 1970 were placed in Group I and all acquisitions after 1969 were placed in Group II. The two groups were divided as such primarily to separate the acquisitions into two approximately equal time periods. The purpose was to determine if assets that had been held over a longer time period versus those held for a shorter period of time would produce the same results.

If the parameters of the two groups are stable over time, then the results of Group I (long-term) and Group II (short-term) will be the same as in Model A (the overall model). On the other hand, if they are not stable over time, then the results will differ and model(s) that are useful in short periods will differ from those in long periods.

Table 6 shows that Group I consists of 37 of the 72 buildings that were acquired prior to 1970. Group II consists of the other 33 buildings acquired after 1969.

The models tested for both groups were the same as those tested for the overall group (72 buildings). Each group was tested using historical cost before an allowance for depreciation and then using historical cost after an

allowance for depreciation. Thus, there were a total of 62 regression equations tested for each group or a total of 124 for both groups.

#### Results of the Tests for Group I

All possible regressions under both hypotheses were performed using the 39 observations in Group I. The results showed that at the 5 percent level of significance, the null hypothesis (Chapter 4) was not rejected for any of the 62 regression equations. Thus, the long-term data in Group I do not produce an acceptable model at the 5 percent level of significance for forecasting net realizable values of buildings.

#### Results of the Tests for Group II

Likewise, all possible regressions were performed using the 33 observations in Group II. The results of these tests showed that eleven models were statistically significant at the 5 percent level of significance. Four of the 11 acceptable models resulted from using historical cost before deducting depreciation. The other seven models resulted from the use of historical cost adjusted for depreciation.

The 11 models (12) through (22) are shown below as follows:

$$Y = b_0 + b_1 X_1 + b_5 X_5; \quad (12)$$

$$Y = b_0 + b_2 X_2 + b_5 X_5; \quad (13)$$

$$Y = b_0 + b_3 X_3 + b_5 X_5; \quad (14)$$

$$Y = b_0 + b_4 X_4 + b_5 X_5; \quad (15)$$

$$Y_1 = b_0 + b_1 X_1 + b_4 X_4; \quad (16)$$

$$Y_1 = b_0 + b_1 X_1 + b_5 X_5; \quad (17)$$

$$Y_1 = b_0 + b_2 X_2 + b_4 X_4; \quad (18)$$

$$Y_1 = b_0 + b_2 X_2 + b_5 X_5; \quad (19)$$

$$Y_1 = b_0 + b_3 X_3 + b_5 X_5; \quad (20)$$

$$Y_1 = b_0 + b_4 X_4 + b_5 X_5; \quad (21)$$

$$Y_1 = b_0 + b_2 X_2 + b_3 X_3 + b_4 X_4. \quad (22)$$

Notably, Model A which includes both Boeckh indexes and the GNP as its variables did not surface as a viable model in either Group I or Group II. An explanation for this is that when Group I and Group II data are combined, the interaction between the independent variables causes Group I data to contribute toward explaining Y. However, when Group I data is analyzed separately, its contribution alone is not statistically significant at the 5 percent level to produce an acceptable model.

The results for all 11 models are individually presented in Table 10. In addition, these models will be hereafter referred to as Models 1 through 11, respectively.

An analysis of the multiple regression results for each of the 11 models showed that no one model met all the characteristics as set forth in Chapter 5 as the best

model. Model 1 has the lowest mean square for error (.10064), Model 6 has the most significant F value (9.70), and the highest  $R^2$  (.3927).

The predictive ability of each model was tested using equation (8) and the original holdout sample (29 buildings) adjusted to include only those buildings that were acquired during the Group II period (1970-1978). Twenty-four of the 29 buildings in the original holdout sample were acquired after 1969. (see Table 7). Tables 11-21 contain the detail predicted values by building and model.

Table 22 is a summary presentation of the range of predicted values, both dollars and percents, for each model. It is easily noticeable that there exists a rather wide range in both predicted values (dollar and percent) for each model. To further illustrate this point, Model 8 has the lowest dollar difference (\$290,350) in the "high" dollar difference column, yet it has one of the highest percent difference (255.4) in the "high" percent difference column. There is no direct relationship between the dollar differences (high and low) and the percent differences; however, use of percent differences in analyzing the various models places differences between actual and predicted selling prices on an equal basis. No one model stands out as producing better results than the others.

Table 10  
Multiple Regression Results  
Models 1-11

	Variable Results				Model Results			
	Variables	$b_i$	Std. Error of Estimate	PR>  T	Mean Square Error	R <sup>2</sup>	F	PR>F
<u>Model 1</u>	Constant	0.12254	0.14418	0.4021	0.10064	0.31361	6.85	0.0035
	BO <sub>1</sub>	-3.45769	0.96583	0.0012				
	GNP	2.48558	0.67168	0.0009				
<u>Model 2</u>	Constant	0.08604	0.14111	0.5466	0.13053	0.10978	1.85	0.1747
	BO <sub>2</sub>	-3.15128	0.89937	0.0015				
	GNP	2.55086	0.70395	0.0011				
<u>Model 3</u>	Constant	-0.03034	0.14279	0.8332	0.11793	0.19573	3.65	0.0381
	EN <sub>1</sub>	-1.48584	0.58097	0.0158				
	GNP	1.24439	0.46080	0.0113				
<u>Model 4</u>	Constant	-0.06712	0.13512	0.6230	0.10965	0.25220	5.06	0.0128
	EN <sub>2</sub>	-1.63737	0.53691	0.0048				
	GNP	1.40245	0.44218	0.0035				

Table 10 (continued)

	Variable Results				Model Results			
	Variables	$b_i$	Std. Error of Estimate	PR>  T	Mean Square Error	R <sup>2</sup>	F	PR>F
<u>Model 5</u>	Constant	-0.15064	0.23356	0.5239	0.23173	0.16809	3.03	0.0633
	BO <sub>1</sub>	4.06932	1.76366	0.0281				
	EN <sub>2</sub>	3.13709	1.48927	0.0436				
<u>Model 6</u>	Constant	0.25777	0.18691	0.1781	0.16915	0.39275	9.70	0.0006
	BO <sub>1</sub>	-4.63718	1.25209	0.0009				
	GNP	3.60894	0.87076	0.0003				
<u>Model 7</u>	Constant	-0.13546	0.21882	0.5406	0.22250	0.20121	3.78	0.0344
	BO <sub>2</sub>	4.01999	1.54289	0.0141				
	EN <sub>2</sub>	-3.51526	1.46633	0.0229				
<u>Model 8</u>	Constant	0.20839	0.18314	0.2642	0.17170	0.38357	9.33	0.0007
	BO <sub>2</sub>	-4.21936	1.16728	0.0011				
	GNP	3.69123	0.91365	0.0003				
<u>Model 9</u>	Constant	0.05746	0.18410	0.7571	0.19605	0.29618	6.31	0.0052
	EN <sub>1</sub>	-2.08104	0.74906	0.0093				
	GNP	2.00988	0.59413	0.0020				

Table 10 (continued)

		Variable Results			Model Results			
Variables	$b_i$	Std. Error of Estimate	PR>  T	Mean Square Error	R <sup>2</sup>	F	PR> F	
<u>Model 10</u>	Constant	0.00586	0.17312	0.9732	0.18001	0.35376	8.21	0.0014
	EN <sub>2</sub>	-2.28975	0.68792	0.0023				
	GNP	2.22856	0.56656	0.0005				
<u>Model 11</u>	Constant	-0.38657	0.23580	0.1119	0.19743	0.31483	4.44	0.0110
	BO <sub>2</sub>	4.00659	1.45339	0.0100				
	EN <sub>1</sub>	8.33925	3.80274	0.0365				
	EN <sub>2</sub>	-11.51433	3.90038	0.0062				



Table 11

Predicted Selling Price and Percentage Relationship in Absolute Terms  
Twenty-Four Buildings in the Holdout Sample

Model 1

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SPC	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
1	70.6	9.0	\$1,160,000	\$ 741,246	\$ 418,754	36.1
4	5.4	14.9	54,545	66,260	11,715	21.5
5	26.3	13.6	8,000	12,323	4,323	54.0
6	95.5	6.8	30,300	14,450	15,850	52.3
9	48.0	22.8	27,200	64,304	37,104	136.4
10	62.6	14.7	1,200	2,739	1,539	128.2
11	55.2	31.7	484,375	411,012	73,363	15.2
12	44.8	14.4	2,030,000	1,603,764	426,236	21.0
13	92.4	25.7	1,940,560	1,268,200	672,360	34.7
14	41.6	5.8	84,490	56,194	28,296	33.5
15	30.1	24.9	15,645	16,817	1,172	7.5
16	30.0	18.4	64,568	109,165	44,597	69.1
17	17.2	1.9	9,750	12,007	2,257	23.2
18	9.9	12.3	58,330	72,620	14,290	24.5
19	15.7	5.8	47,600	53,198	5,598	11.8
21	2.3	13.3	1,195,600	1,013,521	182,079	15.2
22	41.9	23.3	9,728	12,829	3,101	31.9
23	18.8	21.5	54,723	81,881	27,158	49.6
24	37.1	26.8	54,756	110,470	55,714	101.8
25	72.3	27.6	986,496	414,758	571,738	58.0

Table 11 (continued)

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
26	11.8	22.5	\$ 67,237	\$ 93,358	\$ 26,121	38.9
27	66.2	5.8	32,640	20,781	11,859	36.3
28	47.7	13.6	26,040	43,070	17,030	65.4
29	21.9	25.3	241,765	148,213	93,552	38.7
<b>TOTAL</b>			<u>\$8,685,548</u>	<u>\$6,443,180</u>	<u>\$2,745,806</u>	<u>31.6</u>

<sup>a</sup>PCSP-HC is the percent obtained when actual selling price is divided by actual historical cost.

<sup>b</sup>Predicted PCSP-HC is the percent obtained when the predicted selling price is divided by actual historical cost.

<sup>c</sup>Actual SP is the actual selling price of the buildings.

<sup>d</sup>Predicted SP is the predicted selling prices of the buildings as produced by the regression model.

<sup>e</sup>Difference between (c) and (d).

<sup>f</sup>Obtained by dividing (e) by (c).

Table 12

Predicted Selling Price and Percentage Relationship in Absolute Terms  
Twenty-Four Buildings in the Holdout Sample

Model 2

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SPC	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
1	70.6	16.1	\$1,160,000	\$ 789,733	\$ 370,267	31.9
4	5.4	23.3	54,545	71,130	16,585	30.4
5	26.3	22.1	8,000	13,242	5,242	65.5
6	95.5	5.7	30,300	16,379	13,921	45.9
9	48.0	27.5	27,200	66,751	39,551	145.4
10	62.6	5.7	1,200	3,029	1,829	152.4
11	55.2	29.5	484,375	404,262	80,113	16.5
12	44.8	20.0	2,030,000	1,681,844	348,156	17.2
13	92.4	29.4	1,940,560	1,305,008	635,552	32.8
14	41.6	1.0	84,490	59,065	25,425	30.1
15	30.1	17.9	15,645	18,391	2,746	17.6
16	30.0	21.3	64,568	111,872	47,304	73.3
17	17.2	9.5	9,750	12,904	3,154	32.4
18	9.8	16.6	58,330	75,385	17,055	29.2
19	15.7	1.1	47,600	55,871	8,271	17.4
21	22.8	8.6	1,195,600	1,068,431	127,169	10.6
22	41.9	14.8	9,728	14,257	4,529	46.6
23	18.8	22.4	54,723	82,441	27,718	50.7
24	37.1	26.7	54,756	110,312	55,556	101.5
25	72.3	20.2	986,496	457,246	529,250	53.7

Table 12 (continued)

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
26	11.8	23.7	\$ 67,237	\$ 94,231	\$ 26,994	40.2
27	66.2	7.8	32,640	21,174	11,466	35.1
28	47.7	13.1	26,040	43,288	17,248	66.2
29	21.9	14.0	241,765	170,628	71,137	29.4
TOTAL			<u>\$8,685,548</u>	<u>\$6,746,874</u>	<u>\$2,486,238</u>	<u>28.6</u>

<sup>a</sup>PCSP-HC is the percent obtained when actual selling price is divided by actual historical cost.

<sup>b</sup>Predicted PCSP-HC is the percent obtained when the predicted selling price is divided by actual historical cost.

<sup>c</sup>Actual SP is the actual selling price of the buildings.

<sup>d</sup>Predicted SP is the predicted selling prices of the buildings as produced by the regression model.

<sup>e</sup>Difference between (c) and (d).

<sup>f</sup>Obtained by dividing (e) by (c).

Table 13

Predicted Selling Price and Percentage Relationship in Absolute Terms  
Twenty-Four Buildings in the Holdout Sample

Model 3

Bldg. #	Actual PCSP-HCa	Predicted PCSP-HCb	Actual SPC	Predicted SPd	Difference Actual SP to Pred. SPe	% Difference <sup>f</sup>
1	70.6	11.8	\$1,160,000	\$ 760,229	\$ 399,771	34.5
4	5.4	31.7	54,545	75,939	21,394	39.2
5	26.3	34.5	8,000	14,591	6,591	82.4
6	95.5	24.8	30,300	19,342	10,958	36.2
9	48.0	34.0	27,200	70,153	42,953	157.9
10	62.6	.7	1,200	3,234	2,034	169.5
11	55.2	31.1	484,375	409,112	75,263	15.5
12	44.8	13.2	2,030,000	1,587,060	442,940	21.8
13	92.4	15.2	1,940,560	1,161,741	778,819	40.1
14	41.6	1.7	84,490	58,640	25,850	30.6
15	30.1	6.9	15,645	20,835	5,190	33.2
16	30.0	9.8	64,568	101,266	36,698	56.8
17	17.2	19.0	9,750	14,018	4,268	43.8
18	9.8	32.0	58,330	85,361	27,031	46.3
19	15.7	.0	47,600	56,918	9,318	19.6
21	2.3	1.7	1,195,600	1,149,174	46,426	3.9
22	41.9	.8	9,728	16,864	7,136	73.4
23	18.8	10.2	54,723	74,277	19,554	35.7
24	37.1	10.0	54,756	95,793	41,037	75.0
25	72.3	6.4	986,496	535,685	450,811	45.7

Table 13 (continued)

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
26	11.8	10.5	\$ 67,237	\$ 84,180	\$ 16,943	25.2
27	66.2	25.9	32,640	24,728	7,912	24.2
28	47.7	9.4	26,040	54,487	28,447	109.2
29	21.9	13.0	241,765	172,570	69,195	28.6
TOTAL			<u>\$8,685,548</u>	<u>\$6,646,197</u>	<u>\$2,576,539</u>	<u>29.7</u>

<sup>a</sup>PCSP-HC is the percent obtained when actual selling price is divided by actual historical cost.

<sup>b</sup>Predicted PCSP-HC is the percent obtained when the predicted selling price is divided by actual historical cost.

<sup>c</sup>Actual SP is the actual selling price of the buildings.

<sup>d</sup>Predicted SP is the predicted selling prices of the buildings as produced by the regression model.

<sup>e</sup>Difference between (c) and (d).

<sup>f</sup>Obtained by dividing (e) by (c).

Table 14

Predicted Selling Price and Percentage Relationship in Absolute Terms  
Twenty-Four Buildings in the Holdout Sample

Model 4

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
1	70.6	6.7	\$1,160,000	\$ 725,710	\$ 434,290	37.4
4	5.4	31.1	54,545	75,603	21,058	38.6
5	26.3	35.2	8,000	14,670	6,670	83.4
6	95.5	22.3	30,300	18,959	11,341	37.4
9	48.0	37.5	27,200	71,956	44,756	164.5
10	62.6	0.3	1,200	3,220	2,020	168.4
11	55.2	35.1	484,375	421,542	62,833	13.0
12	44.8	9.4	2,030,000	1,534,328	495,672	24.4
13	92.4	14.3	1,940,560	1,152,632	787,928	40.6
14	41.6	0.7	84,490	59,238	25,252	30.0
15	30.1	16.9	15,645	18,597	2,952	18.9
16	30.0	8.6	64,568	100,134	35,566	55.1
17	17.2	18.8	9,750	13,998	4,248	43.6
18	9.8	33.4	58,330	86,286	27,956	47.9
19	15.7	2.2	47,600	57,748	10,148	21.3
21	2.3	5.0	1,195,600	1,110,322	85,278	7.1
22	41.9	1.5	9,728	16,489	6,761	69.5
23	18.8	8.9	54,723	73,355	18,632	34.1
24	37.1	9.6	54,756	95,422	40,666	74.3
25	72.3	16.7	986,496	476,996	509,500	51.7

Table 14 (continued)

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
26	11.8	9.5	\$ 67,237	\$ 83,414	\$ 16,177	24.1
27	66.2	23.7	32,640	24,302	8,338	25.5
28	47.7	4.7	26,040	52,140	26,100	100.2
29	21.9	12.9	241,765	172,708	69,057	28.6
TOTAL			<u>\$8,685,548</u>	<u>\$6,459,769</u>	<u>\$2,753,199</u>	<u>31.7</u>

<sup>a</sup>PCSP-HC is the percent obtained when actual selling price is divided by actual historical cost.

<sup>b</sup>Predicted PCSP-HC is the percent obtained when the predicted selling price is divided by actual historical cost.

<sup>c</sup>Actual SP is the actual selling price of the buildings.

<sup>d</sup>Predicted SP is the predicted selling prices of the buildings as produced by the regression model.

<sup>e</sup>Difference between (c) and (d).

<sup>f</sup>Obtained by dividing (e) by (c)



Table 15

Predicted Selling Price and Percentage Relationship in Absolute Terms  
Twenty-Four Buildings in the Holdout Sample

Model 5

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SPC	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
1	70.6	25.0	\$1,160,000	\$ 849,666	\$ 310,334	26.8
4	5.4	89.6	54,545	109,361	54,816	100.5
5	26.3	98.1	8,000	21,497	13,497	168.7
6	95.5	100.3	30,300	31,051	751	2.5
9	48.0	90.3	27,200	99,645	72,445	266.3
10	62.6	46.9	1,200	4,714	3,514	292.9
11	55.2	70.0	484,375	530,570	46,195	9.5
12	44.8	25.5	2,030,000	1,760,127	269,873	13.3
13	92.4	22.2	1,940,560	1,232,541	708,019	36.5
14	41.6	31.8	84,490	78,679	5,811	6.9
15	30.1	50.9	15,645	33,785	18,140	116.0
16	30.0	19.3	64,568	109,968	45,400	70.3
17	17.2	79.5	9,750	21,145	11,395	116.9
18	9.8	91.6	58,330	123,880	65,550	112.4
19	15.7	37.8	47,600	77,836	30,236	63.5
21	2.3	55.7	1,195,600	1,819,404	623,804	52.2
22	41.9	76.3	9,728	29,498	19,770	203.2
23	18.8	15.2	54,723	77,623	22,900	41.9
24	37.1	10.3	54,756	96,045	41,289	75.4
25	72.3	54.5	986,496	884,724	101,772	10.3

Table 15 (continued)

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference Actual SP to Prec. SP <sup>e</sup>	% Difference <sup>f</sup>
26	11.8	16.8	\$ 67,237	\$ 89,007	\$ 21,770	32.4
27	66.2	84.2	32,640	36,173	3,533	10.8
28	47.7	73.3	26,040	86,315	60,275	231.5
29	21.9	33.2	241,765	264,114	22,349	9.2
<b>TOTAL</b>			<u>\$8,685,548</u>	<u>\$8,467,368</u>	<u>\$2,573,438</u>	<u>29.6</u>

<sup>a</sup>PCSP-HC is the percent obtained when actual selling price is divided by actual historical cost.

<sup>b</sup>Predicted PCSP-HC is the percent obtained when the predicted selling price is divided by actual historical cost.

<sup>c</sup>Actual SP is the actual selling price of the buildings.

<sup>d</sup>Predicted SP is the predicted selling prices of the buildings as produced by the regression model.

<sup>e</sup>Difference between (c) and (d).

<sup>f</sup>Obtained by dividing (e) by (c).

Table 16

Predicted Selling Price and Percentage Relationship in Absolute Terms  
Twenty-Four Buildings in the Holdout Sample

Model 6

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
1	70.6	33.5	\$1,160,000	\$ 907,868	\$ 252,132	21.7
4	5.4	70.2	54,545	98,163	43,618	80.0
5	26.3	67.4	8,000	18,160	10,160	127.0
6	95.5	43.5	30,300	22,240	8,060	26.6
9	48.0	78.4	27,200	93,398	66,198	243.4
10	62.6	9.0	1,200	3,500	2,300	191.7
11	55.2	84.1	484,375	574,586	90,211	18.6
12	44.8	42.7	2,030,000	2,001,021	28,979	1.4
13	92.4	58.8	1,940,560	1,601,564	338,996	17.5
14	41.6	17.9	84,490	70,358	14,132	16.7
15	30.1	24.3	15,645	27,839	12,194	77.9
16	30.0	48.2	64,568	136,596	72,028	111.6
17	17.2	50.6	9,750	17,746	7,996	82.0
18	9.8	60.3	58,330	103,637	45,307	77.7
19	15.7	18.3	47,600	66,796	19,196	40.3
21	2.3	34.8	1,195,600	1,575,081	379,481	31.7
22	41.9	23.6	9,728	20,684	10,956	112.6
23	18.8	51.3	54,723	101,945	47,222	86.3
24	37.1	58.4	54,756	137,985	83,229	152.0
25	72.3	20.8	986,496	691,423	295,073	29.9

Table 16 (continued)

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference Actual SP to Prec. SP <sup>e</sup>	% Difference <sup>f</sup>
26	11.8	54.6	\$ 67,237	\$ 117,750	\$ 50,513	75.1
27	66.2	55.6	32,640	30,568	2,072	6.4
28	47.7	33.0	26,040	66,258	40,218	154.5
29	21.9	6.1	241,765	186,252	55,513	23.0
<b>TOTAL</b>			<u>\$8,685,548</u>	<u>\$8,671,418</u>	<u>\$1,975,784</u>	<u>22.7</u>

<sup>a</sup>PCSP-HC is the percent obtained when actual selling price is divided by actual historical cost.

<sup>b</sup>Predicted PCSP-HC is the percent obtained when the predicted selling price is divided by actual historical cost.

<sup>c</sup>Actual SP is the actual selling price of the buildings.

<sup>d</sup>Predicted SP is the predicted selling prices of the buildings as produced by the regression model.

<sup>e</sup>Difference between (c) and (d).

<sup>f</sup>Obtained by dividing (e) by (c).

Table 17

Predicted Selling Price and Percentage Relationship in Absolute Terms  
Twenty-Four Buildings in the Holdout Sample

Model 7

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
1	70.6	16.4	\$1,160,000	\$ 791,211	\$ 368,789	31.8
4	5.4	84.9	54,545	106,643	52,098	95.5
5	26.3	94.4	8,000	21,097	13,097	163.7
6	95.5	90.7	30,300	29,553	747	2.5
9	48.0	91.1	27,200	100,030	72,830	267.8
10	62.6	36.8	1,200	4,392	3,192	266.0
11	55.2	77.9	484,375	555,295	70,920	14.6
12	44.8	19.1	2,030,000	1,669,365	360,635	17.8
13	92.4	18.2	1,940,560	1,192,060	748,500	38.6
14	41.6	26.0	84,490	75,207	9,283	11.0
15	30.1	41.0	15,645	31,559	15,914	101.7
16	30.0	15.6	64,568	106,556	41,988	65.0
17	17.2	74.3	9,750	20,528	10,778	110.5
18	9.8	92.9	58,330	124,712	66,382	113.8
19	15.7	32.8	47,600	74,998	27,398	57.6
21	2.3	50.2	1,195,600	1,755,727	560,127	46.9
22	41.9	67.8	9,728	28,078	18,350	188.6
23	18.8	13.9	54,723	76,757	22,034	40.3
24	37.1	9.9	54,756	95,733	40,977	74.8
25	72.3	44.4	986,496	826,786	159,710	16.2

Table 17 (continued)

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
26	11.8	15.2	\$ 67,237	\$ 87,781	\$ 20,544	30.6
27	66.2	86.8	32,640	36,695	4,055	12.4
28	47.7	75.5	26,040	87,421	61,381	235.7
29	21.9	18.2	241,765	234,452	7,313	3.0
TOTAL			<u>\$8,685,548</u>	<u>\$8,132,636</u>	<u>\$2,757,042</u>	<u>31.7</u>

<sup>a</sup>PCSP-HC is the percent obtained when actual selling price is divided by actual historical cost.

<sup>b</sup>Predicted PCSP-HC is the percent obtained when the predicted selling price is divided by actual historical cost.

<sup>c</sup>Actual SP is the actual selling price of the buildings.

<sup>d</sup>Predicted SP is the predicted selling prices of the buildings as produced by the regression model.

<sup>e</sup>Difference between (c) and (d).

<sup>f</sup>Obtained by dividing (e) by (c).

Table 18

Predicted Selling Price and Percentage Relationship in Absolute Terms  
Twenty-Four Buildings in the Holdout Sample

## Model 8

Bldg. #	Actual PSCP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
1	70.6	43.0	\$1,160,000	\$ 972,586	\$ 187,414	16.2
4	5.4	81.5	54,545	104,678	50,133	91.9
5	26.3	78.7	8,000	19,390	11,390	142.4
6	95.5	60.2	30,300	24,829	5,471	18.1
9	48.0	84.6	27,200	96,658	69,458	255.4
10	62.6	21.1	1,200	3,889	2,689	224.1
11	55.2	81.2	484,375	565,373	80,998	16.7
12	44.8	50.1	2,030,000	2,105,014	75,014	3.7
13	92.4	63.6	1,940,560	1,650,210	290,350	15.0
14	41.6	24.4	84,490	74,207	10,283	12.2
15	30.1	33.8	15,645	29,966	14,321	91.5
16	30.0	52.0	64,568	140,175	75,607	117.1
17	17.2	60.8	9,750	18,948	9,198	94.3
18	9.8	66.0	58,330	107,332	49,002	84.0
19	15.7	24.6	47,600	70,379	22,779	47.9
21	2.3	41.1	1,195,600	1,649,241	453,641	37.9
22	41.9	35.1	9,728	22,609	12,881	132.4
23	18.8	52.4	54,723	102,659	47,936	87.6
24	37.1	58.1	54,756	137,715	82,959	151.5
25	72.3	30.8	986,496	748,837	237,659	24.1

Table 18 (continued)

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
26	11.8	56.0	\$ 67,237	\$ 118,876	\$ 51,639	76.8
27	66.2	58.3	32,640	31,097	1,543	4.7
28	47.7	33.6	26,040	66,577	40,537	155.7
29	21.9	9.1	241,765	216,370	25,395	10.5
TOTAL			<u>\$8,685,548</u>	<u>\$9,077,615</u>	<u>\$1,908,297</u>	<u>22.0</u>

<sup>a</sup>PCSP-HC is the percent obtained when actual selling price is divided by actual historical cost.

<sup>b</sup>Predicted PCSP-HC is the percent obtained when the predicted selling price is divided by actual historical cost.

<sup>c</sup>Actual SP is the actual selling price of the buildings.

<sup>d</sup>Predicted SP is the predicted selling prices of the buildings as produced by the regression model.

<sup>e</sup>Difference between (c) and (d).

<sup>f</sup>Obtained by dividing (e) by (c).



Table 19

Predicted Selling Price and Percentage Relationship in Absolute Terms  
Twenty-Four Buildings in the Holdout Sample

Model 9

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SPC	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
1	70.6	38.2	\$1,160,000	\$ 940,008	\$ 219,992	19.0
4	5.4	94.0	54,545	111,881	57,336	105.1
5	26.3	96.9	8,000	21,362	13,362	167.0
6	95.5	86.6	30,300	28,924	1,376	4.5
9	48.0	94.9	27,200	102,023	74,823	275.1
10	62.6	29.8	1,200	4,167	2,967	247.3
11	55.2	84.8	484,375	576,749	92,374	19.1
12	44.8	42.1	2,030,000	1,992,701	37,299	1.8
13	92.4	45.7	1,940,560	1,469,841	470,719	24.3
14	41.6	23.4	84,490	73,666	10,824	12.8
15	30.1	47.2	15,645	32,949	17,304	110.6
16	30.0	37.5	64,568	126,742	62,174	96.3
17	17.2	74.1	9,750	20,512	10,762	110.4
18	9.8	88.2	58,330	121,694	63,364	108.6
19	15.7	27.3	47,600	71,889	24,289	51.0
21	2.3	49.5	1,195,600	1,747,925	552,325	46.2
22	41.9	55.3	9,728	25,979	16,251	167.1
23	18.8	37.0	54,723	92,328	37,605	68.7
24	37.1	36.7	54,756	119,036	64,280	117.4
25	72.3	47.9	986,496	846,625	139,871	14.2

Table 19 (continued)

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
26	11.8	39.2	\$ 67,237	\$ 106,063	\$ 38,826	57.7
27	66.2	83.6	32,640	36,060	3,420	10.5
28	47.7	63.7	26,040	81,531	55,491	213.1
29	21.9	9.7	241,765	217,555	24,210	10.0
<b>TOTAL</b>			<u>\$8,685,548</u>	<u>\$8,968,210</u>	<u>\$2,091,244</u>	<u>24.1</u>

<sup>a</sup>PCSP-HC is the percent obtained when actual selling price is divided by actual historical cost.

<sup>b</sup>Predicted PCSP-HC is the percent obtained when the predicted selling price is divided by actual historical cost.

<sup>c</sup>Actual SP is the actual selling price of the buildings.

<sup>d</sup>Predicted SP is the predicted selling prices of the buildings as produced by the regression model.

<sup>e</sup>Difference between (c) and (d).

<sup>f</sup>Obtained by dividing (e) by (c).

Table 20

Predicted Selling Price and Percentage Relationship in Absolute Terms  
Twenty-Four Buildings in the Holdout Sample

Model 10

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
1	70.6	31.1	\$1,160,000	\$ 891,500	\$ 268,500	23.2
4	5.4	93.2	54,545	111,386	56,841	104.2
5	26.3	97.8	8,000	21,467	13,467	168.3
6	95.5	83.1	30,300	28,384	1,916	6.3
9	48.0	99.7	27,200	104,517	77,317	284.3
10	62.6	29.2	1,200	4,148	2,948	245.7
11	55.2	90.3	484,375	593,967	109,592	22.6
12	44.8	36.8	2,030,000	1,918,466	111,534	5.5
13	92.4	44.4	1,940,560	1,456,715	483,845	24.9
14	41.6	24.8	84,490	74,501	9,989	11.8
15	30.1	33.2	15,645	29,830	14,185	90.7
16	30.0	35.7	64,568	125,134	60,566	93.8
17	17.2	73.9	9,750	20,482	10,732	110.7
18	9.8	90.2	58,330	122,954	64,624	110.8
19	15.7	20.3	47,600	73,046	25,446	53.5
21	2.3	44.9	1,195,600	1,693,952	498,352	41.7
22	41.9	52.1	9,728	25,459	15,731	161.7
23	18.8	35.1	54,723	91,017	36,294	66.3
24	37.1	36.0	54,756	118,491	63,735	116.4
25	72.3	33.6	986,496	764,821	221,675	22.5

Table 20 (continued)

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
26	11.8	37.8	\$ 67,237	\$ 104,969	\$ 37,732	56.1
27	66.2	80.5	32,640	35,459	2,819	8.6
28	47.7	57.1	26,040	78,252	52,212	200.5
29	21.9	9.8	241,765	217,800	23,965	9.9
<b>TOTAL</b>			<u>\$8,685,548</u>	<u>\$8,706,717</u>	<u>\$2,264,017</u>	<u>26.1</u>

<sup>a</sup>PCSP-HC is the percent obtained when actual selling price is divided by actual historical cost.

<sup>b</sup>Predicted PCSP-HC is the percent obtained when the predicted selling price is divided by actual historical cost.

<sup>c</sup>Actual SP is the actual selling price of the buildings.

<sup>d</sup>Predicted SP is the predicted selling prices of the buildings as produced by the regression model.

<sup>e</sup>Difference between (c) and (d).

<sup>f</sup>Obtained by dividing (e) by (c).

Table 21

Predicted Selling Price and Percentage Relationship in Absolute Terms  
Twenty-Four Buildings in the Holdout Sample

Model 11

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SPC	Predicted SP <sup>d</sup>	Difference Actual SP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
1	70.6	21.0	\$1,160,000	\$ 537,237	\$ 622,763	53.7
4	5.4	67.9	54,545	96,796	42,251	77.5
5	26.3	81.2	8,000	19,664	11,664	145.8
6	95.5	70.3	30,300	26,402	3,898	12.9
9	48.0	90.9	27,200	99,943	72,743	267.4
10	62.6	33.3	1,200	4,280	3,080	256.7
11	55.2	79.8	484,375	561,100	76,725	15.8
12	44.8	12.0	2,030,000	1,234,125	795,875	39.2
13	92.4	0.1	1,940,560	1,009,472	931,088	48.0
14	41.6	30.0	84,490	77,600	6,890	8.2
15	30.1	9.1	15,645	24,428	8,783	56.1
16	30.0	0.1	64,568	91,626	27,058	41.9
17	17.2	67.4	9,750	19,720	9,970	102.3
18	9.8	82.5	58,330	118,003	59,673	102.3
19	15.7	37.4	47,600	77,606	30,006	63.0
21	2.3	44.9	1,195,600	1,693,676	498,076	41.7
22	41.9	66.8	9,728	27,938	18,210	187.2
23	18.8	3.7	54,723	64,875	10,152	18.6
24	37.1	2.9	54,756	84,566	29,810	54.4
25	72.3	10.9	986,496	635,216	351,280	35.6

Table 21 (continued)

Bldg. #	Actual PCSP-HC <sup>a</sup>	Predicted PCSP-HC <sup>b</sup>	Actual SP <sup>c</sup>	Predicted SP <sup>d</sup>	Difference : Actual AP to Pred. SP <sup>e</sup>	% Difference <sup>f</sup>
26	11.8	.0	\$ 67,237	\$ 76,202	\$ 8,965	13.3
27	66.2	65.1	32,640	32,430	210	0.6
28	47.7	54.7	26,040	77,074	51,034	196.0
29	21.9	26.7	241,765	251,320	9,555	4.0
<b>TOTAL</b>			<u>\$8,685,548</u>	<u>\$6,941,299</u>	<u>\$3,679,759</u>	<u>42.4</u>

<sup>a</sup>PCSP-HC is the percent obtained when actual selling price is divided by actual historical cost.

<sup>b</sup>Predicted PCSP-HC is the percent obtained when the predicted selling price is divided by actual historical cost.

<sup>c</sup>Actual SP is the actual selling price of the buildings.

<sup>d</sup>Predicted SP is the predicted selling prices of the buildings as produced by the regression model.

<sup>e</sup>Difference between (c) and (d).

<sup>f</sup>Obtained by dividing (e) by (c)

Table 22

Summary Comparison of the Range of Differences Between  
Actual and Predicted Selling Prices for Each  
Model Using the 24 Buildings  
in the Holdout Sample

Model	Dollar Difference			Percent Difference		
	High	Low	Mean	High	Low	Mean
1*	\$ 672,360 <sup>1/</sup>	\$ 1,172 <sup>2/</sup>	\$ 114,409	136.4 <sup>3/</sup>	7.5 <sup>4/</sup>	31.6
2	635,552	1,829	103,593	152.4	10.6	28.6
3	778,819	2,034	107,356	169.5	3.9	29.7
4	787,928	2,020	114,717	168.4	7.1	31.7
5	708,019	751	107,227	266.3	2.5	29.6
6	379,481	2,072	82,324	243.4	1.4	22.7
7	748,500	747	114,877	267.8	2.5	31.7
8	290,350	1,543	79,512	255.4	3.7	22.0
9	552,325	1,376	87,135	275.1	1.8	21.8
10	498,352	1,916	94,334	284.3	5.5	26.1
11	931,088	210	153,323	267.4	.6	42.4

\*Example of reported differences for Model 1.  
<sup>1/</sup>Building 13 (\$1,940,560 - \$1,268,200)  
<sup>2/</sup>Building 15 (\$15,645 - \$16,817)  
<sup>3/</sup>Building 9 (\$37,104/\$27,200)  
<sup>4/</sup>Building 15 (\$1,172/\$15,645)

### Two Way Analysis of Variance

In order to statistically determine if any one model is significantly better than all the others, the Friedman two-way analysis of variance by ranks, as described in Chapter 4, was performed.

Table 23 shows the rankings of the individual models using the sum of the ranks.

Table 23  
Models Ranked by Friedman Rank Sums

Rank	Model	Friedman* Rank Sum	% Deviation		
			Low	High	Mean
1	4	119	7.1	168.4	31.7
2	1	120	7.5	136.4	31.6
3	2	124	16.5	152.4	28.6
4	3	124	3.9	169.5	29.7
5	11	141	.6	267.4	42.4
6	6	143	1.4	243.4	22.7
7	8	149	3.7	255.4	22.0
8	7	159	2.5	267.8	31.7
9	5	165	2.5	292.9	29.6
10	10	168	6.3	284.3	26.1
11	9	172	1.8	275.1	21.8

\*The test statistic ( $X^2_T$ ) value from (23) is 15.39.



The computed value for  $X_T^2$  (15.39) is less than the value for  $X_{0.95}^2$  with 10 degrees of freedom (18.31). As a result, the null hypothesis of identical populations can not be rejected. The conclusion, therefore, is that the differences between the actual selling price and the estimated selling price for each model were not significantly different. In other words, the 11 models appear to predict the selling price equally efficiently.

#### Summary

This chapter presented the data collection process and the characteristics of the data used in the study. Useable data on 101 buildings were received, of which 29 were used as a holdout sample to test the predictive ability of the models.

The hypotheses were tested by performing all possible regressions on the data for the 72 buildings. Using the individual t-test for each parameter, 61 of the 62 regression equations were rejected at the 5 percent level of significance. The acceptable model (Model A) was then tested using the hold-out sample (29 buildings). The results produced a wide range between actual selling prices and predicted selling prices, significant enough to question the use of the model in predicting net realizable value for the type of buildings studied.

Further tests were conducted to assert the overall stability of the parameter estimates in Model A by dividing the population (72 buildings) into two groups. The first group (Group I) consisted of buildings acquired prior to 1970 (39 buildings), and the second group (Group II) consisted of buildings acquired after 1969 (33 buildings). All possible regressions (62 equations) were run for each group. All 62 equations for the Group I data were rejected at the 5 percent level of confidence, while 11 models surfaced from the Group II data as being statistically significant at the 5 percent level of confidence. The predictive ability of the 11 models were tested using the appropriate holdout sample. Again, the results produced wide variances between actual and predicted selling prices. The overall percentage differences for all the models ranged from 22.0 to 42.4 percent.

Further tests were conducted to ascertain if any one model (of the 11) was better than all the other models. The results showed that the differences between actual and predicted selling prices for each model were not significantly different.

## Chapter 6

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Summary and Conclusions

The objective of accounting is to provide useful financial information to both internal and external users. Accounting information must be both relevant and reliable to be useful. Assignment of values in the measuring process is very important if useful information is to be reported. Users of accounting data rely on the information reported as a basis for making decisions. Although there are several appropriate measurement methods for assigning values to accounting data, historical cost has been the dominant method used as the basis for keeping accounting records and reporting financial information. However, many accountants are questioning the usefulness of financial information reported under conventional historical cost. The growing dissatisfaction has been intensified by the rapid increase in the rate of inflation.

There has been increasing support for reporting current value information in financial statements. There is a need, both internally and externally, for current value information. Decisions concerning the future can best be made using up-to-date information and current value

accounting can provide such information. It gives the best measurement of the value of resource inputs to be matched with current revenues in order to measure current efficiency for predictive purposes. Such measures are particularly useful in periods of inflation since financial statements prepared under historical cost do not reflect the current values of the assets owned. Old costs are carried forward on the balance sheet, and are charged off against current revenues on the income statement. As a result, measures such as return on investment tend to give meaningless figures.

The need for reporting current value accounting information prompted the Securities and Exchange Commission to issue Accounting Series Release No. 190 requiring certain large corporations to report current value data on a supplemental basis. Shortly thereafter the FASB issued Financial Accounting Standard No. 33 which increased the reporting requirement of current value financial data for most large publicly held corporations. Subsequent to the issue of Statement No. 33, the SEC rescinded Release No. 190.

The trend toward reporting current value data has brought with it the need for a reliable method(s) of determining the current value of assets. This is particularly important in those situations where current market values (prices) are not readily available or are expensive to obtain, such as through appraisals. Industrial and

commercial properties, such as office, warehouse and general purpose buildings fit into this category. Since these assets usually represent a significant part of a firm's assets, there exists a need for some inexpensive and reliable method(s) of determining their current values. Development of such a method(s) is essential to a current value reporting system.

The literature has consistently contended that financial reporting should provide reliable information that is useful in making economic decisions. There is general consensus that usefulness of financial information ranks as the most important criteria for evaluating accounting information. The two primary qualities that determine the usefulness of accounting are relevance and reliability.

Financial information is relevant if it has some effect upon the decision being contemplated; that is, the information can influence the decision making process of someone who does not have prior knowledge of the information.

Reliability implies that the users can rely on the data as representing or reflecting the actual economic conditions or events.

In addition to relevance and reliability, the concept of objectivity has been a dominant factor in measuring and reporting of accounting information. Objectivity has not been precisely defined, even though it is one of the generally accepted accounting principles. As an accounting

principle, it provides that accounting should be based on objective evidence; that is, information should be founded on completed arms-length transactions. Therefore, it is closely related to the criteria of reliability and verifiability and is supportive of the historical cost method of valuing and reporting financial data.

With usefulness as the most important criterion for reported financial information, trade-offs will frequently be required between relevance, reliability and objectivity. Specifically, some reliability and objectivity will have to be given up in order to increase relevance and usefulness. In some cases the current values that are objectively determined or highly reliable may not be available. Fixed assets that do not have readily available market prices, such as buildings, fall in this category.

The second part of the theoretical investigation examined the measurement and valuation concepts in assigning values to objects and events. Uncertainty, conservatism, and limitations of monetary units are constraints which make the measurement process difficult. These constraints must be considered when selecting the best measurement method for communicating useful financial information.

The choice of an asset valuation method for use in reporting financial information is still being discussed in the literature today. At present, the alternatives are historical cost, constant dollar, current value and constant dollar/current value accounting.

The use of current value data for assets has had increasing support because of the advantages that this method has over others. Many perceive current value accounting as producing more relevant and useful information for statement users. FAS. No. 33 currently requires many large companies to report supplemental current value information in their financial statements.

The need for current value data has been established. The unanswered question is which current value method(s) should be used in generating the information to be reported to users. No single current value method has been identified as the best in meeting the objectives of financial reporting.

The third part of the theoretical investigation reviewed the use of net realizable value as a measure of current value. Net realizable value represents the selling price or the amount of cash or generalized purchasing power that each asset owned would generate if disposed of in the open market (not from a forced sale.) There has been strong support for reporting net realizable values for use by both internal and external users. Information that represents the current cash equivalent of assets would be very useful in the decision-making process. Cash flow decisions are of critical importance in the day-to-day operations of a business. Net realizable values may be used to meet the objective of financial reporting, i.e. presenting

useful financial information. Net realizable value is being used currently on a limited basis in the reporting of certain assets.

Several studies have been conducted which investigated the reporting of current value data. Some of the studies concluded that net realizable values could be objectively determined and verified. The purpose of this study was to determine:

- (1) if a model using a specific price index or combination of indexes could predict the relationship between net realizable value and historical cost (where historical cost was the purchase price or construction cost,) and/or
- (2) if a model using a specific price index or combination of indexes could predict the relationship between net realizable and historical cost (where historical is adjusted for depreciation.)

The first objective of the empirical part of the study was to obtain data to be used in developing net realizable value prediction models. First, data were obtained from five specific price indexes for the period 1959 through the third quarter 1981. Next, data for the assets (buildings) included in the study were obtained through the use of a mail data gathering form sent to the controllers and financial vice-presidents of the top 1,000 Fortune companies in 1980. Data regarding the acquisition cost and sales price of certain types of buildings (office, warehouse and general purpose) were requested. Usable data for 101 buildings were returned. A holdout sample



representing the most recent 29 sales was selected, with the remaining 72 buildings used to develop a model(s). Ordinary least squares regression was performed using all possible combinations of the independent variables. All possible combinations of the independent variables produced 31 separate regression equations. The 31 equations were first tested using historical cost before an allowance for depreciation and then tested again using historical cost after an allowance for depreciation. Thus, a total of 62 regression equations were tested. Specifically, the regression equations were used to determine if the percent change in an index or combination of indexes over time was closely related to the percent change in the acquisition cost and selling price of an asset (building) over the same time period. A close relationship could indicate that indexes could be used to predict net realizable values for these assets. A five percent level of significance was established for rejection of the null hypotheses. The null hypotheses were stated as:

H<sub>01</sub>: There is no relationship between the percent change, as measured from the date of purchase to date of sale, of net realizable value to historical cost (before depreciation) and the percent change (measured for the same time period) in a specific price index or combination of indexes.

H<sub>02</sub>: There is no relationship between the percent change, as measured from date of purchase to date of sale, of net realizable value to historical cost (after depreciation) and the percent change (measured for the same time period) in a specific price index or combination of indexes.

The null hypothesis ( $H_{01}$ ) was not rejected at the five percent level of confidence for any of the 31 regression equations tested. Thus, the change in the independent variables (price indexes) do not explain the change in the dependent variable (selling price less historical cost.) When the second hypothesis ( $H_{02}$ ) was tested, one equation (model) surfaced as being statistically acceptable at the five percent level of significance. The predictive model includes three independent variables: (1) the percent change in the Boeckh Index for apartments, hotels and office buildings, (2) the percent change in the Boeckh Index for commercial and factory buildings and (3) the percent change in the Gross National Product-Implicit Price Deflator Index for gross private domestic fixed investment in non-residential structures. The p-value for the Student t-test of each of the independent variables was less than 5 percent.

The predictive ability of the acceptable model was tested using the parameter estimates derived from the regression equation. Historical cost (after depreciation) for each building (29 buildings) included in the holdout sample was adjusted by the parameter estimates producing a predicted selling price for each building. A comparison of the predicted values with actual selling prices for each building showed that a wide range existed between the values. In order to provide for equal weights among buildings, the dollars were changed to percentage differences.

Again, the range between actual and predicted selling prices was large enough to question the practical application of the model in predicting net realizable values for buildings of the type included in the study.

Further tests were conducted to substantiate the overall stability of the parameters in the model. The data were divided into two groups, identified as long-term and short-term. The short-term group was made up of buildings acquired after 1969, and the long-term group consisted of the buildings acquired prior to 1970. The purpose was to ascertain if different periods of time had any influence or affect on the model. That is, would buildings acquired in the sixties produce different results than buildings acquired in the seventies. The same equations tested for the original (overall) group were tested for each of the two sub-groups. The results showed that the null hypotheses for the 62 equations in the long-term group were not rejected at the five percent level of significance. On the other hand the short-term group produced 11 models that were statistically acceptable at the five percent level of confidence. Four of the eleven models resulted from the use of historical cost unadjusted for depreciation, while the other seven were models that included historical cost adjusted for depreciation.

An examination of other measurements (MSE, F value and  $R^2$ ) revealed that no one model was better than the other models. The predictive ability of these eleven models was

tested using the holdout sample. The models were used to predict the selling price of each building in the holdout sample. Again, the overall range between predicted selling price and actual selling price was significant.

The Friedman two way analysis of variance test was performed to statistically determine if at least one model was significantly different from all the others. The results showed that the models were not significantly different from each other.

In conclusion, there exists a need for reporting net realizable value data to both internal and external users. The reporting of net realizable values fulfills the objective of financial reporting.

The results of the specific tests conducted revealed that within the scope and limitations of the research conducted, specific price indexes are not adequate predictors of the net realizable value for offices, warehouses, and general purpose buildings even though statistically significant models were developed. This is based on the results obtained when the models were tested using the holdout sample. However, on the positive side, the use of short-term data produced more models that were statistically acceptable. This means that the predictive ability of the independent variables increases, or is better when the time period between acquisition and selling price is short.

Finally, the reliability of these models in predicting net realizable values of buildings for use in financial reporting is questionable. The variance between actual and predicted net realizable value exceed acceptable limits in financial reporting. The net realizable value for accounts receivable is reported at the amount expected to be collected. The difference between actual and estimate is usually minimal. Overall variances ranging from 22.0 to 42.4 percent for buildings, as produced by the study, would not appear to represent current value as expected by the users of financial data.

#### Future Research

Although the research did not produce entirely positive results, several models were developed which indicate a need for further investigation of using price indexes to predict net realizable values. In order to validate the models developed in this study, future research could include an expansion of the sample size to include a greater number of buildings. The inclusion of a greater population is needed to test the "long-term" and "short-term" models, since each contained fewer than 40 observations.

Also, future research could include the use of a general price index(es) to ascertain if the movement of prices in general as reflected by such an index(es) is related to the change in values of buildings. In addition, future research could segment the sample population (assuming

sufficient data are available) by geographic regions. This will allow the testing of whether a model(s) might be a better predictor for a particular geographic region(s). The geographic areas can be further segmented into metropolitan and non-metropolitan areas.

Additional research is needed which examines buildings that have had capitalized additions during the time they were owned. A model including these data should be tested to determine if more acceptable predictive results could be obtained when these data are introduced into the model.

Building usage may also be considered in future research. For example, warehouse buildings could be analyzed separately from office buildings to determine if a specific price index(es) would predict different results for different buildings.

Future research could also investigate the degree of variability that statement readers may be willing to accept in reported current value figures. The models developed in this study had overall variability ranging from 22.0 to 42.4 percent and individual building variance ranging from .6 to 292.9 percent from actual net realizable values. While this may appear to be unacceptable at first glance, it is possible that statement users may find these data preferable to historical cost which has an even greater variability when compared to actual realizable value.

These alternatives for future research should be investigated because there exists a need for net realizable value data for assets that do not have used market data readily available. Continued research is needed to produce an objective, simple and inexpensive method of predicting net realizable value for these assets. However, if no objective, inexpensive method for determining net realizable value for buildings can be found, other alternatives to providing this information could be considered. These include:

- (1) the use of net realizable value only when objectively measurable, such as in the measurement of accounts receivable, inventories and investments, and use cost for all other items;
- (2) use of appraisals made every 3-5 years instead of cost as stated in (1) above;
- (3) the use of cost figures in financial statements and net realizable value ranges for buildings in footnotes to financial statements... the footnotes would include an explanation as to how the figures were derived; and
- (4) the use of a short-term predictive model, assuming one was acceptable for reporting purposes, every year and updating its accuracy by revaluing assets (buildings) every 3-5 years through appraisals, thus appraisal costs would only be incurred every 3-5 years.

In any case, this study is not expected to be the end of the search for developing an objective, inexpensive method of determining net realizable values for assets

such as those used in this study. Future researchers should view this study as the beginning point and as a challenge to develop methods that can provide realistic current value information to be used for financial reporting.



## BIBLIOGRAPHY

### Books

- Accounting Principles Board. "Basic Concepts and Accounting Principles Underlying Financial Statements for Business Enterprises." Statement No. 4. New York: American Institute of Certified Public Accountants, 1970.
- Accounting Principles Board. "Financial Statements Restated for General Price-Level Changes." Statement No. 3. Vol. II. New York: American Institute of Certified Public Accountants, 1973.
- American Accounting Association. A Statement of Basic Accounting Theory. Chicago, Illinois: AAA, 1966.
- American Institute of Certified Public Accountants. "Reporting the Financial Effects of Price-Level Changes." Accounting Research Study No. 6. New York: American Institute of Certified Public Accountants, 1963.
- Arthur Anderson & Company. Objectives of Financial Statements for Business Enterprises. Arthur Anderson & Company, 1972.
- Arthur Young & Company. Financial Reporting and Changing Prices: A Survey of Preparers Views and Practices. New York: Arthur Young & Company, 1982.
- Bedford, Norton M., and McKeown, James C. "Comparative Analysis of Net Realizable Value and Replacement Costing." Readings in Inflation Accounting. Edited by P. T. Wanless and D. A. R. Forrester. Chicester, England: Wiley and Sons, 1979.
- Bevis, Donald J. "Appraising the Four Schools." Asset Valuation and Income Determination. Edited by Robert Sterling. Lawrence, Kansas: Scholars Book Company, 1971.
- Carscallen, Morley P. "How Financial Reporting Has Responded to Changing Values." Current Value Accounting: A Practical Guide for Business. Edited by Warren Chippendale and Philip L. Defliese. New York: AMACOM, 1977.

- Carscallan, Morley P., and Johnson, Kenneth P. Financial Reporting Under Changing Values: An Introduction to Current Value Accounting. American Management Association, 1977.
- Chambers, R. J. Accounting Evaluation and Economic Behavior. Englewood, New Jersey: Prentice-Hall, Inc., 1965.
- Committee on Accounting Concepts and Standards. Accounting and Reporting for Corporate Financial Statements and Preceding Statements and Supplements. Columbus, Ohio: American Accounting Association, 1957.
- Daniel, Wayne W. Applied Nonparametric Statistics. Houghton Mifflin Company: Boston, Massachusetts, 1978.
- Edwards, Edgar O., and Bell, Philip W. The Theory and Measurements of Business Income. 4th ed. Berkeley, California: University of California Press, 1967.
- Ernst and Ernst. Financial Reporting Briefs. Cleveland: Ohio, Ernst and Ernst, 1977.
- Financial Accounting Standards Board. "Financial Reporting in Units of General Purchasing Power." Exposure Draft. Stamford, Conn.: Financial Accounting Standards Board, 1974.
- Financial Accounting Standards Board. "Objectives of Financial Reporting by Business Enterprises." Statements of Financial Accounting Concepts No. 1, Stamford, Conn.: Financial Accounting Standards Board, November, 1978.
- Financial Accounting Standards Board. "Financial Reporting and Changing Prices." Statement of Financial Accounting Standards No. 33. Stamford, Conn., Financial Accounting Standards Board, September, 1979 .
- Financial Accounting Standards Board. "Qualitative Characteristics of Accounting Information." Statement of Financial Accounting Concepts No. 2. Stamford, Conn., Financial Accounting Standards Board, May, 1980 .
- Gynther, R. S. Accounting for Price-Level Changes: Theory and Procedures. Oxford, Pergamon Press, 1960.

- Hendriksen, Eldon S. Accounting Theory. rev. ed. Homewood, Illinois: Richard D. Urwin, Inc., 1970.
- Ijiri, Yuji. "A Defense of Historical Cost Accounting." Readings in Inflation Accounting. Edited by P. T. Wanless and D. A. R. Forrester. Chicester, England: Wiley and Sons, 1979.
- Kieso, Donald E., and Weygandt, Jerry J. Intermediate Accounting. New York: John Wiley and Sons, Inc., 1980.
- MacNeill, James H. "Response to a Defense for Historical Cost Accounting." Asset Valuation. Edited by Robert R. Sterling. Lawrence, Kansas: Scholars Book Company, 1971.
- Moonitz, Maurice. "The Basic Postulates of Accounting." Accounting Research Study No. 1. New York: American Institute of Certified Public Accountants, 1961.
- Paton, William A. Accounting Theory. Edited by Robert R. Sterling. Lawrence, Kansas: Scholars Book Company, 1973.
- Paton, W. A. and Littleton, A. C. An Introduction to Corporate Accounting Standards. American Accounting Association, 1955.
- Report of the Study Group on the Objectives of Financial Statements. New York: AICPA, October, 1973.
- Revsine, Lawrence. Replacement Cost Accounting. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973.
- Rosen, L. S. Current Value Accounting and Price-Level Restatements. Toronto: Institute of Chartered Accountants, 1972.
- SAS Institute, Inc. A User's Guide - 1979 Edition. Cary, North Carolina, 1979.
- Sprouse, Robert T. "The Measurements of Financial Position and Income Purpose and Procedure." Research in Accounting Measurement. Edited by Robert K. Jaedicke, Ijiri Yuji, and Oswald Nielson. Chicago, Illinois: American Accounting Association, 1966.

Sprouse, Robert T., and Moonitz, Maurice. "A Tentative Set of Broad Accounting Principles for Business Enterprises." Accounting Research No. 3. American Institute of Certified Public Accountants, 1962.

Sterling, Robert R. Theory of the Measurements of Enterprise Income. Lawrence; University Press of Kansas, 1970.

U.S. Department of Commerce. "Construction and Real Estate--Construction Cost Indexes and Construction Materials." Business Statistics (The Biennial Supplement to the Survey of Current Business, 1967 p. 51, 1973 p. 53 and 1975 p. 55.

\_\_\_\_\_. "Current Business Statistics--Construction and Real Estate/Construction Cost Indexes." Survey of Current Business, February issues 1959-1981.

\_\_\_\_\_. "GNP Implicit Price Deflator." Survey of Current Business, Quarterly issues 1959-1981.

\_\_\_\_\_. "1963 Statistical Supplement to the Survey of Current Business--Construction and Real Estate--Construction Cost Indexes and Construction Materials." Business Statistics 1963 Edition, p. 50.

\_\_\_\_\_. "1979 Statistical Supplement to the Survey of Current Business--Construction and Real Estate--Construction Cost Indexes and Construction Materials." Business Statistics 1979 Edition, p. 46.

#### Periodicals

American Accounting Association. Committee on Concepts and Standards - Long-Lived Assets. "Accounting for Land, Buildings, and Equipment, Supplementary Statement No. 1." The Accounting Review, 39 (July 1964), 693-699.

American Accounting Association. Committee on Inventory Measurement. "A Discussion of Various Approaches to Inventory Measurement." The Accounting Review, 39 (July 1964), 700-714.

American Accounting Association. Committee on the Realization Concepts. "The Realization Concept." The Accounting Review, 40 (April 1965), 312-333.

- Beaver, William H., Kennelly, John W., and Voss, William M. "Predictive Ability as a Criterion for Evaluation of Accounting Data." The Accounting Review, 43 (October 1968), 680.
- Brenner, Vincent C. "Financial Statement Users' Views of the Desirability of Reporting Current Cost Information." The Journal of Accounting Research, 8 (Autumn 1970), 159-166.
- Burton, John C. "Financial Reporting in an Age of Inflation." Journal of Accountancy, (February 1975), 68-71.
- Chambers, R. J. "NOD, COG, and PuPu, "see how inflation teases!," Journal of Accountancy, 140 (September 1975), 56-62.
- Chambers, R. J. "Price-Level Adjusted Accounting." The Accountant, 162 (March 19, 1970), 408.
- Dickens, Robert L. and Blackburn, John O. "Holding Gains on Fixed Assets: An Element of Business Income." The Accounting Review, 39 (April 1964), 315.
- Dohr, James L. "Cost and Value." Journal of Accountancy, (March 1944), 193.
- Ernst and Ernst. "Additional Views on Accounting Objectives." (n.p.: May 1972), 19.
- Garner, Donald E. "The Need for Price-Level and Replacement Value Data." The Journal of Accountancy, 134 (September 1971), 94-98.
- Givins, Horace R. "Basic Accounting Postulates." The Accounting Review, 41 (July 1966), 459.
- Gress, Edward J. "Application of Replacement Cost Accounting: A Case Study." ABACUS, 1 (July 1972), 3-12.
- Hartman, Bart P. and Zaunbrecher, H. C. "Comparability and Objectivity of Exit Value Accounting: A Comment." The Accounting Review, 51 (October 1976), 927-929.
- Ijiri, Yuji and Jaedicke, Robert K. "Reliability and Objectivity of Accounting Measurements." The Accounting Review, 41 (July 1966), 481.
- Knortz, Herbert C. "The Challenge of Economic Realism." The Financial Executive, 41 (January 1973), 18.

- Littleton, A. C. "Significance of Invested Costs." The Accounting Review, (April 1952), 171.
- McDonald, Daniel L. "A Test Application of the Feasibility of Market Based Measures in Accounting," The Journal of Accounting Research, 6 (Spring 1968), 38-49.
- McKeown, James C. "An Empirical Test of a Model Proposed by Chambers." The Accounting Review, 1 (January 1971), 12-29.
- Mautz, Robert K. "A Few Words for Historical Costs." Financial Executive, 41 (January 1973), 23-27.
- Miller, Elwood L. "What's Wrong With Price-Level Accounting." Harvard Business Review, (November-December 1978), 113.
- Nelson, G. Kenneth. "Current and Historical Costs in Financial Statements." The Accounting Review, 41 (January 1966), 44-45.
- Parker, James E. "Testing Comparability and Objectivity of Exit Value Accounting." The Accounting Review, (July 1975), 512-524.
- "Reports from the Committee on Financial Accounting Standards." The Accounting Review, (Supplement to Vol. 51, 1976), 214-261.
- Snavely, Howard J. "Accounting Information Criterion." The Accounting Review, 42 (April 1976), 224.
- "Statements to the Study Group on Financial Statements." C.P.A. Journal, 42 (November 1972), 886.
- Sterling, Robert R. "Conservatism: The Fundamental Principle of Valuation in Traditional Accounting." ABACUS, (December 1967), 131.
- Sterling, Robert R. "Relevant Financial Reporting in an Age of Price Changes." Journal of Accountancy, (February 1975), 42-51.
- Sterling, Robert R. and Radosevich, Raymond. "A Valuation Experiment." Journal of Accounting Research, 7 (Spring 1969), 91.

Miscellaneous

Weiner, David Peter. "The Feasibility of Obtaining an Objective Measure of the Current Value of Land and Buildings for Disclosure in Published Financial Statements." Unpublished Ph.D. dissertation, The University of Michigan, 1972.

**APPENDIX**

**REPRODUCTION OF COVER LETTER  
AND QUESTIONNAIRE**



Department of Accounting  
College of Business Administration  
3101 CEBA  
Louisiana State University  
Baton Rouge, Louisiana 70803  
February 16, 1982

Dear

The current trend in financial reporting is towards the inclusion of current value data in financial statements. Although the use of price indexes is one method that can be used to determine the current value of assets, there has been little or no research to determine the reliability of index adjusted data.

I am a doctoral student at Louisiana State University. My dissertation concerns testing the reliability of specific price indices in predicting net realizable value for certain type assets (buildings). If an index or combination of indexes can be used to predict net realizable value, the approach would provide an objective and verifiable method of estimating current value for use in both internal and external reporting.

The study requires a nationwide sample of properties (buildings) that were acquired since 1958, held for at least three years, and then sold. Attached is a short data collection form that I am using to gather the necessary information. Your company's response will be held in complete confidence; the company name is not requested. The data will be reported in summary form and used only in performing certain statistical analyses.

Will you please forward the data collection form to the appropriate individual for completion. A self-addressed, postage paid envelope is provided for return of the form. I desperately need your help and cooperation if the study is to be successful. I am most thankful for whatever assistance you can give me.

If you would like to receive a copy of the results of the study, fill in your name and address below and return to me.

Sincerely,

Jerry J. Baudin

Enclosure

\_\_\_\_\_  
Name \_\_\_\_\_

Address \_\_\_\_\_

To Preparer:

Data Collection Form on Acquisition and Sale of Selected Type Buildings

The completion of this study is dependent on the data you provide. Please provide data for six commercial or industrial buildings (limited to office and warehouse type buildings) that were operational assets, acquired after 1958, used for at least three years, and then sold. It is important that both acquisition and selling prices be provided. If all the information is not available, or you can furnish data on fewer than six properties, I would greatly appreciate whatever you can provide me. If on the other hand, you can provide more than six properties without inconvenience on your part, please do so as I need as much data as I can get for the study. Identify the type of building as warehouse, office, administration, all purpose, utility, etc.

Please return the completed questionnaire in the self-addressed prepaid envelope to:

Jerry J. Baudin  
 Department of Accounting  
 College of Business  
 Administration  
 3101 CEBA  
 Louisiana State University  
 Baton Rouge, LA 70803

Thank you very much.

Property	Date Bldg. Acquired (Mo/Yr)	Acquisition Cost of Building	Est. Useful Life of Bldg. (Years)	Cost of Capitalized Addition(s) any to Bldg.	Date of Capitalized Addition(s) (Mo/Yr)	Date Bldg. Sold (Mo/Yr)	Selling Price of Bldg.	Location of Bldg. (State)	Type of Bldg.
# 1	_____	\$ _____	_____	\$ _____ \$ _____ \$ _____	_____	_____	\$ _____	_____	_____
# 2	_____	\$ _____	_____	\$ _____ \$ _____ \$ _____	_____	_____	\$ _____	_____	_____
# 3	_____	\$ _____	_____	\$ _____ \$ _____ \$ _____	_____	_____	\$ _____	_____	_____
# 4	_____	\$ _____	_____	\$ _____ \$ _____ \$ _____	_____	_____	\$ _____	_____	_____
# 5	_____	\$ _____	_____	\$ _____ \$ _____ \$ _____	_____	_____	\$ _____	_____	_____
# 6	_____	\$ _____	_____	\$ _____ \$ _____ \$ _____	_____	_____	\$ _____	_____	_____

When land and building are acquired and/or sold for a lump sum amount, how is cost assigned to each? (Please check one).

\_\_\_ Relative Market (Appraisal) Value \_\_\_ Other\*

EXPLANATION and/or COMMENTS:

\*If other, please provide a brief explanation of method used.

VITA

Name: Jerry J. Baudin

Born: Bordelonville, Louisiana  
October 29, 1942

Academic Degrees: B.S. in Accounting  
University of Southwestern Louisiana,  
1963  
M.B.A.  
Louisiana State University, 1971

Accounting Experience: U.S. General Accounting Office  
1963-1967

Academic Experience: Instructor of Accounting (Part-  
time) Louisiana State University  
1971 - Present

Membership: American Accounting Association

Other: Certified Public Accountant  
State of Louisiana, 1979


**EXAMINATION AND THESIS REPORT**

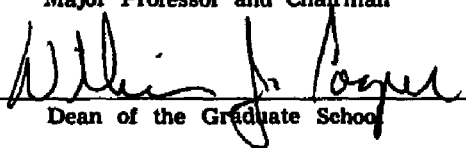
**Candidate:** Jerry J. Baudin

**Major Field:** Accounting




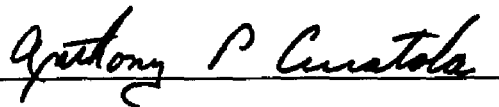
**Title of Thesis:** "The Usefulness and Predictability of Net Realizable Values:  
An Empirical Study"

**Approved:**

  
Major Professor and Chairman

  
Dean of the Graduate School

**EXAMINING COMMITTEE:**

**Date of Examination:**

July 8, 1982