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**A THEORETICAL AND EMPIRICAL INVESTIGATION OF THE EFFECTS
OF FASB STATEMENT NO. 33 ON LENDING DECISIONS**

City University of New York

PH.D. 1983

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A THEORETICAL AND EMPIRICAL INVESTIGATION OF THE
EFFECTS OF FASB STATEMENT NO. 33 ON LENDING DECISIONS

by

MOSTAFA M. EL-MAKSY

A dissertation submitted to the Graduate Faculty in
Accountancy in partial fulfillment of the requirements
for the degree of Doctor of Philosophy, The City
University of New York.

1982

This manuscript has been read and accepted for the Graduate Faculty in Accountancy in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
LIST OF TABLES	x
LIST OF EXHIBITS	xiv
CHAPTER	
I. INTRODUCTION	1
Historical Background	1
Theoretical Background	4
Objective, Motivation and Importance of Research	5
Objective of Research	5
Motivation and Importance of Research	6
Coverage of the Remaining Chapters	7
II. LITERATURE REVIEW	10
Section One: Review of the Theoretical Literature	10
The Historical Cost/Nominal Dollar (HC/ND) Basis	11
Principles and Assumptions Underlying the HC/ND Basis	11
The 'Historical Cost' Principle	13
Problems Caused by the HC Principle and Its Underlying Assumption	14
The 'Unit of Measure' Principle	16
Problems Caused by the 'Unit of Measure' Principle and Its Assumption	17
Evaluation of the HC/ND Basis	18
The Historical Cost/Constant Dollar (HC/CD) Basis	18
Principles and Assumptions Underlying the HC/CD Basis	19
Evaluation of the HC/CD Basis	20
The Current Cost/Nominal Dollar (CC/ND) Basis	20
Principles and Assumptions Underlying the CC/ND Basis	22
Evaluation of the CC/ND Basis	23
A Closer Look at the Disadvantages of the CC/ND Basis	23
The Current Cost/Constant Dollar (CC/CD) Basis	26
Principles and Assumptions Underlying the CC/CD Basis	26
Evaluation of the CC/CD Basis	27
Section Two: Review of the Empirical Research Studies	27
Part (A): Studies Investigating the Effects of Adjustments for Changing Prices on the Elements of Financial Statements and Ratios	29
Part (B): Studies Examining the Predictive Ability of Data Adjusted for Changing Prices Vis-A-Vis the HC Data	30
Part (C): Studies Assessing the Perceived Usefulness of Accounting Data Adjusted for the Effects of Changing Prices	30
Part (D): Studies Examining the Usefulness and Ranking (by Various User Groups) of Accounting Data Adjusted for the Effects of Changing Prices Relative to Other Information Items .	34
Part (E): Studies Investigating the Effects of Adjustments for Changing Prices on Decisions	35

CHAPTER	Page
Dyckman (1969)	36
McIntyre (1973)	36
Heintz (1973)	38
McEnroe and Nikolai (1979)	39
Stone (1980)	41
Diamond and Arnold (1979)	41
III. THE DECISION MAKING MODEL OF CREDIT GRANTORS	47
The Decision Making Model of Commercial Lenders	47
Objectives of the Model	48
Mechanical Modeling (Z Scoring)	48
Procedures of the Model	49
(a) The Commercial Lending Decision Process in General	50
(b) Illustrations of Specific Lending Procedures	52
(c) The Credit Function	52
The Credit Analysis Function of the Model: An Elaboration	55
Input Variables or Factors Involved in Lending Decisions	57
A. Factors Relating to the Borrower	58
A-1. Factors Relating to the Borrower's Business	60
A-2. Factors Relating to the Borrower's Management	60
B. Factors Relating to the Loan	60
C. Factors Relating to the Bank	60
D. Factors Relating to the Relationship Between the Borrower and the Bank	60
E. General Factors	60
Specific Financial Information Requirements of Bank Loan Officers	61
Ranking of Information Importance by Bank Loan Officers	62
Use of Information Preferred by Bank Loan Officers	70
(a) Delaying or Declining Credit Decisions	70
(b) Use of Information Items Rated Very Important	70
How These Information Items Were Used??.....	71
(c) Use of Information Items Rated Important	72
How These Information Items Were Used?	72
(d) Financial Statement Analysis	73
Financial Ratios Used by Bank Loan Officers	74
Framework of the Decision Making Model of Commercial Bank Loan Officers	75
Sequential Steps in Decision Making	78
Standard Operating Procedures (SOPs) and Implicit SOPs	79
Auditor's Opinion and Bank Loan Officer's Decision Making Process	80
Implicit SOPs, Concepts, and Syntactic Context	80
Implicit SOPs and Information Overload	81
How Bank Loan Officers Make Their Decisions?	81
IV. ARE SFAS 33 DISCLOSURES HELPFUL TO LENDERS IN MAKING THEIR DECISIONS?	83
Analysis of SFAS 33 Disclosures	83
A. CD Information	83
B. CC Information	84
C. Five-Year Summary of Selected Financial Data	86

Why Are SFAS 33 Disclosures Believed to Help Lenders in Making Their Decisions?	87
A. Reasons Indicated in SFAS 33 Itself	87
(a) The Assessment of Future Cash Flows	88
(b) The Assessment of Enterprise Performance	90
(c) The Assessment of the Erosion of Operating Capability	91
(d) The Assessment of the Erosion of General Purchasing Power	91
B. Reasons Indicated in Letters of Comment on the Exposure Draft Prior to Issuing SFAS 33	92
C. Reasons Indicated in Discussion Memorandum on Reporting Funds Flows, Liquidity, and Financial Flexibility	95
D. Reasons Indicated in the Accounting Literature	96
Should SFAS 33 Disclosures Fit Into the Decision Making Model of Lenders?	103
A. Should SFAS 33 Disclosures Help Achieve the Objectives or Enhance the Procedures of Commercial Lenders' Decision Model?	104
(a) Income from Continuing Operations on an HC/CD Basis	104
(b) The Purchasing Power Gain or Loss on Net Monetary Items ..	105
(c) Income from Continuing Operations on a CC Basis	105
(d) The CC Amounts of Inventory and Property, Plant & Equipment at Fiscal Year End	105
(e) Increases or Decreases in CC of Inventory and Property, Plant & Equipment During Year	106
(f) Five-Year Summary of Selected Financial Data	106
B. Should Financial Ratios Become More Meaningful if Computed Using SFAS 33 Disclosures Rather Than HC Data?	107
Analysis of Individual Ratios	108
(a) Short-Term Liquidity Ratios	108
(1) The Current Ratio	108
(2) The Quick (Acid-Test) Ratio	113
(3) Working Capital/Total Assets	113
(b) Activity (or Turnover) Ratios	113
(4) Sales/Total Assets (or Asset Turnover)	113
(5) Sales/Accounts Receivable	116
(6) Sales/Inventory	116
(7) Sales/Working Capital	117
(8) Sales/Net Worth	117
(c) Long-Term Solvency Ratios	117
(9) Times Interest Earned Ratio	117
(10) Funds Flow from Operations/Debt Service	119
(11) Net Worth/Total Debt	120
(12) Total Debt/Total Assets	120
(d) Profitability Ratios	121
(13) Operating Profits as a Percentage of Sales	121
(14) Net Operating Profits/Total Assets	122
V. RESEARCH DESIGN, VARIABLES & HYPOTHESES	124
A. The Research Design	124
(a) The Business Loan Decision Situation	124

(b) The Decision Makers (Bank Lending Officers)	126
(c) Levels of Financial Information	127
(d) The Firm	128
Criteria for Selecting the Company Used in the Study	129
(e) Research Methods	133
B. The Research Variables	136
Basic Idea of the Research Design	137
C. The Questionnaire: Additional Information	139
D. Research Hypotheses	141
Hypotheses' Development, Rationale, and Tests to be Used ...	141
Main Hypotheses	141
Ancillary Hypotheses	145
E. Additional Insights: Which Level of Information is Preferable?	146
A Set of Criteria	147
(1) Degree of Consensus	147
(2) Consistency of Decision Makers	148
Statements of Hypotheses to Test the Set of Criteria	150
(1) Hypotheses to Test the Degree of Consensus	151
(2) Hypotheses to Test the Consistency of Decision Makers .	151
VI. DATA GATHERING AND RESEARCH RESULTS	152
Sample Selection and Analysis	152
Testing the Ancillary Hypotheses	153
Testing the First Ancillary Hypothesis: The Difference in Risk	
Attitude and Experience Among Groups is not Statistically	
Significant	153
Testing the Second Ancillary Hypothesis: The Interaction Effect	
Between Information Levels and Presentation Modes is not	
Statistically Significant	155
Testing the Main Hypotheses	156
Testing the First Main Hypothesis: The Effect of SFAS 33 Data	
on Lending Decisions is not Statistically Significant	156
A. Testing Using One-way ANOVA	157
B. Testing Using Pair-wise Comparisons	159
Testing the Second Main Hypothesis: The Effect of SFAS 33 Data	
Presentation Mode on Lending Decisions is not Statistically	
Significant	164
A. Testing Using One-way ANOVA	165
B. Testing Using Pair-wise Comparisons	165
Testing the Third Main Hypothesis: The Effect of the Type of	
SFAS 33 Data on Lending Decisions is not Statistically	
Significant	167
A. Testing Using One-way ANOVA	167
B. Testing Using Pair-wise Comparisons	168
Testing the Fourth Main Hypothesis: The Effect of SFAS 33 Data	
on the Time Consumed in Data Analysis is not Statistically	
Significant	170
A. Testing Using One-way ANOVA	171
B. Testing Using Pair-wise Comparisons	171

CHAPTER

Page

Testing the Fifth Main Hypothesis: The Effect of SFAS 33 Data on the Degree of Consensus Among Decision Makers is not Statistically Significant	173
Testing the Sixth Main Hypothesis: The Effect of SFAS 33 Data on the Consistency of Decision Makers is not Statistically Significant	175
Applying All Preferability Criteria Combined	181
Testing the Relationships Among All Variables	183
A. Testing Using Simple Correlation	183
Analysis of the Relationships Among Variables	184
B. Testing Using Canonical Correlation	190
Analysis of the Relationship Between Subject Variables and Task Variables	191
VII. SUMMARY, CONCLUSIONS, LIMITATIONS, AND RECOMMENDATIONS	195
Summary and Conclusions	195
Limitations	201
A. Limitations Related to Research Methodology	201
B. Limitations Related to Research Design	205
Recommendations for Future Research	208
APPENDIX	
A. COPIES OF THE QUESTIONNAIRE PACKAGES	209
A-1 Covering Letter from the Chairman of the Dissertation Committee Urging Loan Officers' Cooperation	209
A-2 Covering Letter from the Researcher Specifying Research Objective, Response Date, and Offering an Incentive to Respond	210
A-3 Second Request from the Researcher	211
A-4 Questionnaire Mailed to All Groups	212
A-5 Annual Report Mailed to Group No. 7 and How the Annual Reports Mailed to the Other Groups Differed from it	216
B. ANALYSIS OF RESPONDENTS	225
C. ADDITIONAL STATISTICAL TABLES	239
D. ADDITIONAL EXHIBITS	246
BIBLIOGRAPHY	263
AUTOBIOGRAPHICAL STATEMENT	277

LIST OF TABLES

TABLE		Page
II-1	Summary of Studies Investigating the Effects of Adjustments for Changing Prices on the Financial Statements Elements and Ratios .	29
II-2	Summary of Studies Examining the Predictive Ability of Data Adjusted for Changing Prices Vis-A-Vis HC Data	31
II-3	Summary of Studies Assessing the Perceived Usefulness (by Preparers and Various User Groups) of Accounting Data Adjusted for Changing Prices	32
II-4	Summary of Studies Examining the Usefulness and Ranking (by Various User Groups) of Accounting Data Adjusted for the Effects of Changing Prices Relative to Other Information Items ..	35
II-5	Summary of Studies Investigating the Effects of Adjustments for Changing Prices on Decisions	46
III-1	Use of Information Items Rated 'Very Important'	71
III-2	The Most Commonly Used Ratios in Statistical Studies	75
IV-1	Letters of Comment on the Exposure Draft Classified by Source ...	93
V-1	Companies Meeting the Selection Criteria	131
VI-1	F Ratios from One-way ANOVA to Test for Differences in Means of Each Task Variable Among the Four Information Levels	158
VI-2	Student t Values for Differences in Means of Each Task Variable Between the Control Information Level and Each of the Treatment Levels	160
VI-3	Z Values from the Mann-Whitney U Test for Differences in Each Task Variable Between the Control Information Level and Each of the Treatment Levels	161
VI-4	F Ratios from One-way ANOVA to Test for the Effects of SFAS 33 Data Presentation Mode on Each Task Variable	165
VI-5	Student t Values for Differences in Means of Each Task Variable Between the Two Modes of SFAS 33 Data Presentation	166
VI-6	Z Values from the Mann-Whitney U Test for the Differences in Each Task Variable Between the Two Modes of SFAS 33 Data Presentation.	166
VI-7	F Ratios from One-way ANOVA to Test for the Effects of the Type of SFAS 33 Disclosures on Each Task Variable	168

TABLE		Page
VI-8	Student t Values for Differences in Means of Each Task Variable Between Each Two of the Treatment Information Levels	169
VI-9	Z Values from the Mann-Whitney U Test for Differences in Each Task Variable Between Each Two of the Treatment Information Levels	170
VI-10	F, t and Z Values for Differences in Time Consumed in Data Analysis and Making Decisions Between the Control Information Level and Each of the Treatment Levels	172
VI-11	F Values from the F Test for Differences in Variance of Each Task Variable Between the Control Information Level and Each of the Treatment Levels	174
VI-12	Information Levels Having the Smallest Variance for Each Task Variable	175
VI-13	Information Levels Having the Highest Correlation Significance Between Each Two Variables Shown	177
VI-14	Information Levels Having the Most Significant Partial Correlation Between Each Two Variables Shown While Keeping Risk Attitude and Experience Constant	178
VI-15	The Consistency Scores [Variable 4 + Variable 7 - 100] and the Implicitly Preferred Information Level	179
VI-16	t and Z Values for Differences in Means of Consistency Scores Between Each Two Information Levels Shown	180
VI-17	Spearman Rank-Order Correlation Coefficients (and Their Significance) Between Variables 4 and 7 and the Implicitly Preferred Information Level	180
VI-18	Information Levels Implicitly Preferred Under Various Criteria..	181
VI-19	Absolute and Relative Frequencies of Preference to Each Information Level	182
VI-20	Differences Between the Mean Probability of Default on the 3-Year Loan and the Mean Probability of Default on the 6-Month Loan	186
VI-21	Differences Between the Mean Interest Rate Over Prime on the 3-Year Loan and That on the 6-Month Loan	187
VI-22	Means of Certain Task Variables and the Time Spent in Data Analysis	189
VI-23	Chi-Square Values for the First and Second Canonical Correlations	192

TABLE		Page
B-1	Categorization of Subjects by State, Number of Cities, and Number of Banks	225
B-2	Categorization of Questionnaires Returned Unfilled by Reason Given	226
B-3	Categorization of Questionnaires Returned Unfilled by State, Number of Cities, and Number of Banks	227
B-4	Categorization of Respondents by Risk Attitude	228
B-5	Categorization of Respondents by Experience	228
B-6	Frequency Distribution of Respondents by Risk Attitude and Experience for the Control Group [No. 1]	228
B-7	Frequency Distribution of Respondents by Risk Attitude and Experience for Group No. 2	229
B-8	Frequency Distribution of Respondents by Risk Attitude and Experience for Group No. 3	229
B-9	Frequency Distribution of Respondents by Risk Attitude and Experience for Group No. 4	229
B-10	Frequency Distribution of Respondents by Risk Attitude and Experience for Group No. 5	230
B-11	Frequency Distribution of Respondents by Risk Attitude and Experience for Group No. 6	230
B-12	Frequency Distribution of Respondents by Risk Attitude and Experience for Group No. 7	230
B-13	Categorization of Respondents by Membership in Professional Banking Associations	231
B-14	Categorization of Subjects by Title	231
B-15	Categorization of Subjects by Bank Size	232
B-16	Categorization of Subjects by Bank Activity Ratio	232
B-17	Relationships Among Respondents, Sample, and Population of Loan Officers [Classified by Sex, RMA Membership and Geographic Location]	232
B-18	Banks Surveyed [Arranged in Alphabetical Order by State, City, and Name of Bank]	234
C-1	Student t Values for Differences in Means of Risk Attitude and Experience Between the Control Information Level and Each of the Treatment Levels	239

TABLE		Page
C-2	Z Values from the Mann-Whitney U Test for Differences in Risk Attitude and Experience Between the Control Information level and Each of the Treatment Levels	239
C-3	Canonical Discriminant Functions for Discrimination Among the 7 Groups on the Basis of Risk Attitude, Experience, Bank Size and Bank Activity Ratio	240
C-4	F Ratios from a 2-Factor ANOVA Test of Interaction Effects Between Presentation Modes and Information Levels for Each Task Variable	240
C-5	Spearman Rank-Order Correlation Coefficients for the Control Information Level (Group 1) [Classified by Bank Size]	241
C-6	Spearman Rank-Order Correlation Coefficients for All Banks: First Presentation Mode [Classified by Information Level and Group]	242
C-7	Spearman Rank-Order Correlation Coefficients for All Banks: Second Presentation Mode [Classified by Information Level and Group]	243
C-8	Spearman Rank-Order Correlation Coefficients for All Banks: Both Presentation Modes [Classified by Information Level and Group]	244
C-9	Partial Correlation Coefficients While Keeping Risk Attitude and Experience Constant for All Banks [Classified by Mode, Level and Group]	245

LIST OF EXHIBITS

EXHIBIT		Page
III-1	Bank Procedures for Analyzing Business Loan Applications	51
III-2	Commercial Bank Procedure Chart for Processing a Commercial Loan	53
III-3	Frequently Used Methods of Performing Internal Checking, Research, and Validation	54
III-4	Frequently Used Methods of Confirming or Investigating an Application for a Commercial Loan--External Information	55
III-5	Factors Affecting Risk (Financial Statement Items Excluded)	56
III-6	Input Factors Considered in Lending Decisions	59
III-7	Importance Rating of Financial Information by Bank Loan Officers	64
III-8	Financial Ratios Used in Statistical Studies	76
III-9	Framework of the Decision Making Model of Commercial Bank Loan Officers	77
IV-1	Should SFAS 33 Disclosures Fit Into the Decision Making Model of Lenders?	123
V-1	Research Components and Choices	124
V-2	The Basic Design	138
D-1	Advantages and Disadvantages of Four Financial Reporting Bases	246
D-2	Discussion of the Eight Main Sections of Cohen et al (1966) Model Shown in Exhibit III-1	250
D-3	Discussion of the Eight Phases of RMA (1978) Model Shown in Exhibit III-2	251
D-4	Systematizing the Decision Processes of Bank Lending Officers for Seasonal Business Loans	252
D-5	Discussion of the Five Segments of Cohen et al (1966) Computer Model	253
D-5-1	Decision Structure Table For Tentative Solvency Rating	254
D-5-2	Decision Structure Table For Final Solvency Rating	254
D-5-3	Factors Determining Profitability Rating	255
D-6	Robert Morris Associates' Spread Sheets	256

EXHIBIT		Page
D-7	Sample of Letters of Comment on the Exposure Draft Prior to Issuing SFAS 33	257
D-7-1	Letter Representing the Banks' View Regarding Financial Statements of the Financial Institutions	257
D-7-2	Letters Representing the Banks' View Regarding Financial Statements of the Industrial Corporations	257
D-7-3	Letters Representing Financial Analysts' View	258
D-8	An Example Illustrating that Current Operating Profits Equal Funds Flow Available for Expansion and Distribution	259
D-9	Additional Benefits of Current Cost Data	260

CHAPTER I
INTRODUCTION

The major objective of this research is to theoretically and empirically investigate the effects of the Financial Accounting Standards Board (FASB)'s Statement of Financial Accounting Standard No. 33 (SFAS 33) on lending decisions. This chapter presents the historical and theoretical backgrounds of SFAS 33, statement of objective, motivation and importance of the study, and the coverage of the remaining chapters of the dissertation.

The business loan granted by commercial banks is chosen for the empirical part of this research because it is a decision situation where the role of accounting information is vital. However, the rationale behind this choice as well as the choices of other research components are discussed in more detail in Chapter V.

Historical Background

Accounting literature has long recognized that price changes cause difficulties in measuring and comparing financial statement elements. As Professor Paton [1922, p. 427] noted:

"The value of the dollar -its purchasing power- is subject to serious change over a period of years...Accountants deal with an unstable, variable unit; and comparisons of unadjusted accounting statements prepared at intervals are accordingly always more or less unsatisfactory and are often positively misleading"¹

Griffin [1979, p.1] stated:

"There is no other issue in the evolution of accounting thought which has received more attention, generated so much literature, and been debated so exhaustively as measuring and reporting the effects of changing prices and inflation."

From 1922 to 1974, the accounting problems related to sharp increases

¹The procedures for restating financial statements to a constant-dollar basis can be traced back to before 1922. [See, for example, Middleditch, 1918]. Generally, however, the credit for developing constant-dollar accounting is given to Sweeney (1936).

in the general level of prices have been discussed widely in accounting literature and were extensively studied by the accounting authoritative bodies in the U.S. [American Institute of Certified Public Accountants (AICPA) 1947, 1948, 1953, 1963, 1965, and 1969; and FASB, 1974].

In 1961 a different view of accounting for inflation, i.e., the adjustments for the increases in the prices of specific goods and services, was emphasized and, in 1975, rapidly gained the support of many accounting academicians and practitioners. [e.g., Edwards and Bell (1961), Burton (1975), Kapnick (1976), Lacey (1976), and Touche Ross & Co. (1976)]. Still others were not sure whether either view is the panacea for the accounting problems caused by inflation. [e.g., Sterling (1975), and Vancil (1976)].

Thus, three different views can be identified: the first argues that General Price Level Adjusted (GPLA) financial statements is the proper way to account for inflation; the second argues that Replacement Cost (RC) or some sort of Current Cost (CC) is the more logical way to do so because inflation affects every individual firm in a specific way; and the third view argues that there is a need for both Constant Dollar (CD) and CC data in addition to the present Historical Cost (HC) financial statements. Of course, there are those who believe that HC financial statements should not be changed or supplemented with any data on inflation effects. [See, for example, Anthony (1976) and Ijiri (1980)].²

In March 1976, the Securities and Exchange Commission (SEC) supported the RC view by issuing its Accounting Series Release (ASR) No. 190 requiring certain publicly held companies to disclose RC information about inventory; cost of sales; property, plant, and equipment (PPE); and depreciation.

²However, as will be discussed in more detail in Chapter II, Ijiri does not object very strongly to the HC/CD basis.

In December 1978, the FASB supported the third view by issuing an Exposure Draft entitled "Financial Reporting and Changing Prices." In September 1979, it issued SFAS 33, with the same title, making the disclosure of CD and CC information, for the first time, a part of generally accepted accounting principles.³ SFAS 33 applies to public enterprises that have either (1) inventories and gross PPE amounting to more than \$125 million, or (2) total assets amounting to more than \$1 billion. SFAS 33 required these firms to report two sets of supplementary information beside the primary HC financial statements:

1. Constant Dollar (CD) Information:

- a. income from continuing operations adjusted for the effects of general inflation.
- b. the purchasing power gain or loss on net monetary items.

2. Current Cost (CC) Information:

- a. income from continuing operations on a current cost basis.
- b. the CC amounts of inventory and PPE at fiscal year-end.
- c. increases or decreases in CC amounts of inventory and PPE, net of inflation.

The FASB states that SFAS 33 is based on the objectives set out in its Statement of Financial Accounting Concepts (SFAC) No. 1 which concludes that "financial reporting should provide information to help investors,

³ Beside some differences with respect to the enterprises and financial statement items that are subject to the requirements of ASR 190 and those of SFAS 33, there are certain technical differences between the measurement of RC as was required under ASR 190 and CC as required under SFAS 33. For example, under ASR 190, the RC of an asset was defined as the "lowest amount that would have to be paid in the normal course of business to obtain a new asset of equivalent operating or productive capability" whereas under SFAS 33 the CC of an asset is defined as the "amount that would have to be paid to acquire an identical asset currently." (emphasis added). Furthermore, under ASR 190, RC of goods sold and of inventory may include expected cost savings from production and labor efficiencies resulting from obtaining new facilities and equipment, whereas under SFAS 33 the CC of these items are not assumed to include cost savings because no changes in assets are assumed. Notwithstanding these technical differences, RC and CC are used synonymously in this dissertation.

creditors, and others assess the amounts, timing, and uncertainty of prospective net cash flows to the enterprise." SFAC No. 1 also calls for the provision of information about economic resources of an enterprise in a manner that provides direct and indirect evidence of cash flow potential [Para. 50, emphases added].

Theoretical Background

After extensive review of the accounting literature, public hearings, analyses and deliberations, the FASB came to the conclusion that SFAS 33 disclosures would be useful to investors, creditors, and others in making their decisions. The rationale behind this conclusion is discussed in detail in Chapter IV, but is summarized in the following paragraphs as quoted from SFAS 33.

SFAS 33 disclosures will help users in the following specific ways.

[SFAS 33, Para. 3 and 94]:

"a. Assessment of future cash flows

Present financial statements include measurements of assets and expenses at historical prices. Changes in the prices of assets during the period between their acquisition and use or sale are generally not reported. Supplementary information about those price changes will provide an up-to-date basis for users' assessment of future cash flows.

b. Assessment of enterprise performance

The worth of an enterprise can be increased as a result of prudent timing of asset purchases when prices are changing. That increase is one aspect of performance even though it may be distinguished from operating performance. For example, an enterprise may decide to increase its inventory beyond the minimum required level in order to avoid expected future increases in prices. If the price increases do take place, the decision will have increased the worth of resources. Thus, measurements that reflect current prices can provide a basis for assessing the extent to which past decisions on the acquisition of assets have created opportunities for earning future cash flows. Also, the disclosure of the effects of price changes may provide an improved basis for assessing the worth of the resources of an enterprise and hence for assessing its financial performance.

c. Assessment of the erosion of operating capability

In assessing the future prospects of an enterprise, the users of financial reports are typically interested in whether or not an enterprise has maintained its operating capability (the ability to supply a given quantity of goods and services). The maintenance of operating capability requires the holding of minimum quantities of inventory, PPE, and perhaps other assets. When the prices of those assets are increasing, larger amounts of money investment are needed to maintain the previous levels of output. Information on the current prices of resources that are used to generate revenues can help users to assess the extent to which and the manner in which the enterprise's operating capability has been maintained.

d. Assessment of the erosion of general purchasing power

Cash distributions by an enterprise to investors are used partly for consumption, that is, for expenditures that will determine investors' standard of living. For most people, the ultimate objective of investing is to maintain or improve their standard of living or to increase their estate. When prices in general are increasing, larger sums of money are needed to maintain a fixed standard of living. If rates of return are (approximately) fixed, larger cash distributions may be obtained only as a result of increases in the amount of money invested. The amount of additional investment required depends on the rate of inflation and the extent to which it is compensated by changes in the rates of return. Financial information that reflects changes in the general purchasing power can provide an improved basis for assessing whether an enterprise has maintained the purchasing power of its capital."

One aspect of this research is to empirically test the above theoretical background of SFAS 33 as it relates to creditors' decisions.

Because SFAS 33 has just been issued recently, its effects will undoubtedly be investigated from various angles.⁴ As indicated earlier, this research study is a theoretical as well as an empirical investigation of the effects of SFAS 33 on lending decisions. The specific objective, motivation and importance of the research are presented below.

Objective, Motivation and Importance of Research

Objective of Research

The basic objective of this research is to determine (1) in what way(s), if any, could the disclosures under SFAS 33 be used by credit

⁴See, for example, Newsreport [Journal of Accountancy, August 1982, p. 10] for a list of 12 ongoing research projects on SFAS 33. None of these projects, however, is studying the effects of SFAS 33 on lending decisions.

grantors in making their decisions, and (2) whether these disclosures lead commercial lenders to reach different decisions from those reached using HC data alone.

This objective is achieved in two major phases:

- (1) A theoretical model is developed to show how SFAS 33 disclosures could be used by lenders in making their decisions.
- (2) An empirical investigation is conducted to determine whether and how these disclosures affect the decisions of commercial bank lenders.

Motivation and Importance of Research

As Abdel-Khalik and Keller [1979, p.52] noted, "Judgement formation by decision makers who continue to utilize accounting information in making choices with implications for resource allocations may be important in its own right.... Studies about how users use accounting information in forming judgements... is, therefore, an important area for accounting research." One aspect of this dissertation is to investigate how lenders could use SFAS 33 disclosures in making their decisions.

Furthermore, the results of this study should have implications for accounting thought and future research. At the present time, there are two completely opposing views about the possible effects of SFAS 33. On the one hand, the FASB (which goes through a very careful and deliberate process before issuing its statements) claims that SFAS 33 will help lenders in making their decisions through better assessment of future cash flows and of the erosion of general purchasing power and operating capability [SFAS 33, Para. 3]. On the other hand, pilot interviews (with 10 bank lending officers from 5 different banks in the New York metropolitan area) and a leading banker (Waterston, 1979) indicate that SFAS 33 will

not help lenders because CC disclosures are "subjective, not reliable or verifiable, and clearly hypothetical." These lending officers also argue that CD data will not help them because they are based on changes in the general level of prices which may not reflect the changes in the specific prices of goods and services of a particular borrower. An attempt to conduct an in-depth investigation of this obvious contradiction between the accounting standards setter's view and that of a group of sophisticated users of accounting data is one of the principal motivations of this study.

The results of this research should also be of interest to the FASB and other organizations such as Robert Morris Associates (RMA) and the Financial Analysts Federation (FAF) as well as to security analysts in general. The FASB has already stated that it "intends to study the extent to which the information is used, the types of people to whom it is useful, and the purpose for which it is used." [SFAS 33, para. 15]. Members of RMA and FAF and security analysts would be interested to know how these new data are being used, if at all, by their colleagues.

Coverage of the Remaining Chapters

Chapter II presents a review of the theoretical literature discussing the deficiencies of the Historical Cost/Nominal Dollar (HC/ND) reporting basis and 3 alternative reporting bases that are believed by their proponents to overcome those deficiencies: Historical Cost/Constant Dollar (HC/CD), Current Cost/Nominal Dollar (CC/ND), and Current Cost/Constant Dollar (CC/CD). These three alternative bases are, in a sense, what is required by SFAS 33 as supplementary data. Chapter II also presents a critical review of some of the research studies which attempted to test whether the theoretical advantages of the alternative reporting bases are supported by empirical evidence.

Chapter III is directed at developing a framework for the decision making model of credit grantors, particularly commercial lenders. It uses other published studies relating to the decision making models of commercial lenders in general to determine what procedures are used in, and what information, specifically financial statement information, is required by bank lending officers for making their decisions, and how do they arrive at those decisions. Furthermore, personal interviews with a sample of bank lending officers (BLOs) were conducted to augment the library research.

Chapter IV is a detailed attempt to answer the question: are SFAS 33 disclosures helpful to lenders in making their decisions? It contains a detailed analysis of SFAS 33 disclosures and why the FASB and others believe that these disclosures are helpful to lenders in making their decisions. It also includes a comparative analysis which shows that most of these disclosures can be accommodated in the decision making model of commercial lenders as outlined in Chapter III.

Chapter V presents the research design, variables, and hypotheses as well as the theoretical and behavioral bases of the questionnaire development.

A loan decision situation is constructed and a field study, using 7 groups of BLOs (including one control group), as decision makers, is conducted. The research variables include 7 task variables (concerning loan amounts, interest rates, and probability of default), 6 subject variables (concerning decision maker's risk preference, title, membership in professional banking associations, experience, bank size and bank activity ratio), and one interaction variable (the time spent in data analysis and making decisions). Six main null hypotheses are developed: (1)

SFAS 33 data do not lead to decisions different from those based on HC data, (2) SFAS 33 data presentation mode does not affect lending decisions, (3) the type of SFAS 33 data does not affect lending decisions, (4) SFAS 33 data do not affect the time spent in data analysis and making decisions, (5) SFAS 33 data do not affect the degree of consensus among decision makers, and (6) SFAS 33 data do not affect the consistency of decisions.

Chapter VI contains the methods of data gathering, statistical tests of research hypotheses, and interpretation of the results. As discussed in detail in the chapter, only one of the 6 null hypotheses developed in Chapter V (i.e., No. 4) could be rejected. The most likely reason for the lack of statistically significant effects of SFAS 33 on lending decisions is that SFAS 33 data are "too new" for BLOs to analyze effectively.

Chapter VII presents a summary of the study, its conclusions and limitations, and recommendations for further research.

The appendices to the study include copies of the questionnaire packages, analyses of respondents, and some statistical tables and exhibits.

CHAPTER II LITERATURE REVIEW

One of the basic reasons behind the issuance of SFAS 33 is a recognition by the FASB that the HC/ND basis has certain deficiencies as it does not report the effects of price changes on the activities of an enterprise. Such effects are believed to be relevant, and thus needed, for investors' and lenders' decision making.

The objective of this chapter is to present a review of the theoretical literature discussing the deficiencies of the HC/ND basis and 3 alternative reporting bases that are believed by their proponents to overcome those deficiencies. The chapter also presents a critical review of some of the research studies which attempted to test whether the theoretical advantages claimed for the alternative reporting bases are supported by empirical evidence.

The purpose of this literature review is two-fold: (1) to put the present study in its appropriate perspective by directing the reader's attention to what has already been done in this area, and (2) to pinpoint some of the limitations of previous empirical research studies so that the reader may be able to evaluate the improvements made in this study over prior research. Such an improvement can be measured by the extent to which this study has avoided the limitations of prior studies.¹ Thus, this chapter is divided into two sections: Section One covers the theoretical literature and Section Two presents a critical review of some empirical research studies.

Section One Review of the Theoretical Literature

This section presents a theoretical evaluation of the HC/ND basis and

¹In general, most of the limitations of the studies reviewed in Section Two are avoided in the present study. Moreover, the limitations of Diamond and Arnold (1979) study, whose objective more closely resembles the objective of the present study, are analyzed in greater detail and an explanation is presented of how the present study has avoided those limitations.

3 alternative reporting bases including a discussion of the principles and assumptions underlying each basis (and where applicable, the problems caused by those principles and assumptions).

The Historical Cost/Nominal Dollar (HC/ND) Basis

Principles and Assumptions Underlying the HC/ND Basis

A review of the current literature reveals that there seems to be a widespread agreement that the HC/ND financial statements (F/S) are, at best, irrelevant, and, at worst, misleading in conveying meaningful economic data.²

The inadequacy of the HC/ND basis has become clearer in the light of the inflationary trends of the past few years. The weakness of this basis is a direct consequence of the weakness of some of the principles and assumptions underlying it.

Specifically, the HC/ND basis ignores the fact that the general purchasing power of the dollar changes significantly over time,³ and that the specific prices of individual assets do also change over time.⁴ Ignoring these changes in the general and specific price levels is reflected in the

² See, for example, Brenner (1970), Fabricant (1971), Gythner (1971), Baxter (1975), Burton (1975 & 1976), Chambers (1975), Loebbecke (1976), Wilson (1976), Castellano (1978), Seidler (1980), and Lucas (1981). Some important exceptions, however, are Anthony (1976) and Ijiri (1980).

³ This is the basic assumption underlying the 'Unit of Measure' principle as defined in APB Statement No. 4 (para. 166): "The U.S. dollar is the unit of measure in financial accounting in the United States. Changes in its general purchasing power are not recognized in the basic financial statements." Even though the Accounting Principles Board recognized that "Defining the unit of measure in terms of money presents problems because of decreases (inflation) or increases (deflation) in the general purchasing power of money over time," it concluded that "The effects of inflation in the United States are not considered sufficiently important at this time [October 1970] to require recognition in financial accounting measurements."

⁴ This is the basic assumption underlying the 'Initial Recording of Assets and Liabilities' principle [generally known in the accounting literature as the 'Historical Cost' principle] as defined in APB Statement No. 4 (para. 145): "Assets and liabilities generally are recorded on the basis of events in which the enterprise acquires resources from other entities or incurs obligations to other entities. The assets and liabilities are measured by the exchange prices at which the transfers take place."

assumptions underlying the 'Unit of Measure' and the 'Historical Cost' principles respectively.⁵ These assumptions are obviously inconsistent with the realities of changing prices witnessed in recent years.⁶

Even though the objectivity concept inherent in the HC/ND basis is important, the HC/ND reports are becoming less and less relevant as a guide to rational economic decisions as prices change. Thus, an important question arises: should relevance be sacrificed for objectivity? If less objective 'fair market values', for example, tend to be more and more relevant as prices change, should the HC/ND basis be continued even though it reports less and less relevant, but 'objective' data? It seems difficult to disagree with those who maintain that if information lacks the quality of relevance, it makes little difference what other qualities it may have.⁷

To critically analyze the deficiencies of the HC/ND basis, it should be noted that there are inflation-related problems which are caused by the above mentioned two principles and their underlying assumptions as discussed below.

⁵ These assumptions were tolerated over the years, however, primarily because of the relatively low rates of inflation and the emphasis placed on the objectivity concept of the accounting reports--a virtue most often emphasized in defense of the HC/ND basis.

⁶ For a very lucid explanation of the weaknesses inherent in the HC/ND basis, see Stamp (1972).

⁷ Report of the Study Group on the Objectives of Financial Statements, p. 57. While the Study Group considered relevance of information to decisions the most important quality, the FASB, in SFAC No. 2, viewed the characteristics of accounting information that make it a desirable commodity as a hierarchy of qualities, with 'usefulness for decision making' of most importance. The FASB went on to state that the two primary qualities that make accounting information useful for decision making are relevance and reliability. To be relevant, information must be timely and it must have predictive value or feedback value or both. To be reliable, information must have representational faithfulness (i.e., faithfully represent what it purports to represent) and it must be verifiable and neutral. [The FASB avoided reference to 'objectivity' directly]. If either of those qualities is completely missing, the information will not be useful. The FASB admits that these two qualities may be contradictory: "it may be necessary to sacrifice some of one quality for a gain in another" (SFAC No. 2, p.x).

The Historical Cost Principle

This principle requires that the accounting records be maintained at original transaction prices and that the costs be retained throughout the the accounting process to serve as the basis for values in the accounts and in the financial statements. This has an impact both on asset valuation and income determination.

Obviously, during a period of rising prices, asset amounts based on the HC principle rarely conform with the current cost or the market value of these assets at the balance sheet date. While cost generally represents 'fair market value' at the time of the transaction, the market value of an asset may change substantially as time passes on, particularly during an inflationary period. Thus, the HC principle renders the financial statements of limited significance to interested external parties such as investors and creditors, who are usually more concerned about the current value (CV) of an enterprise's economic resources and much less about what the original cost of these resources was.

The HC principle also contradicts another important accounting principle, i.e., the matching principle, and thus leads to inappropriately determined periodic income measures because it does not provide a measure of current period income when prices are changing. The HC/ND basis measures income by matching HC, at which transactions were originally recorded, with realized revenues in the current period. For certain items, where the benefit is received and utilized by the firm at virtually the same time the cost is incurred, such as wages and other operating expenses, HC may be very close to CC. But whenever there is a time lag between acquisition and utilization, HC may differ from CC, and the larger the time lag, the more sub-

stantial the difference may be.⁸

Problems Caused by the HC Principle and its Underlying Assumption

The problems caused by the HC principle and its underlying assumption may be summarized as follows:

(1) The HC/ND basis tends to report 'inflated' profits when prices are rising. Revenues tend to rise but that part of the cost of goods sold (COGS) which represents purchases of property, plant, and equipment (PPE) and inventories at earlier dates will generally be based on lower past costs. The resulting profit is, therefore, not a measure of current operating profit (COP) but also includes some holding gains.⁹ Opponents of the HC/ND basis argue that for investors and creditors concerned about predicting expected future earnings, the relevance of HC income, which confuses holding gains (HG) with COP, is probably limited.¹⁰

(2) Financial statements based on HC may also have undesirable consequences affecting the firm itself. For while the HC/ND basis of measuring income may insure the maintenance of the original money capital invested in the firm, in times of rising prices, this original money capital may not be

⁸The Accounting Principles Board (APB) has recognized this problem with respect to the purchasing power of the dollar: "If moderate inflation or deflation persists for several years or if substantial inflation or deflation occurs over short periods, the general purchasing power of the dollars in which expenses are measured may differ significantly from the general purchasing power of the dollars in which revenues are measured." [APB Statement No. 4, para. 168]. See also footnote 3.

⁹Edwards and Bell (1961), Chapter III, includes an extensive discussion of the distinction between COP and realized and unrealized holding gains. Basically, however, COP is the difference between revenues and expenses measured at current cost (CC); realized holding gain is the difference between expenses measured at CC and the same items measured at HC, [It is also the difference between COP and HC profit]; and unrealized HG is the difference between the CC and HC of assets at the balance sheet date.

¹⁰It should be noted, however, as will be discussed in Section Two of this chapter, that Prakash and Sunder (1979) show that COP is not superior to HC profit in predicting expected future earnings.

sufficient to maintain the firm's operating capacity due to increased replacement cost of inventories sold and PPE used up in normal operations. The 'inflated' profits under the HC/ND basis may not be regarded as a measure of 'distributable' income. If such profits are distributed in full, the physical operating capacity of the firm may be impaired unless external financing is secured to replace sold inventory and consumed operating assets, at higher current prices. This phenomenon has been referred to by Mathews and Grant (1958) as the 'capital erosion' effect of the HC/ND basis.

(3) The HC/ND basis may also lead to suboptimum managerial decisions. The use of inflated profits in relation to undervalued assets may result in artificially high accounting rates of return on invested assets. If these rates of return are used as measures of performance, the result may be quite misleading. Firms and their managements may be given much greater credit than they deserve. With such performance measures, capital intensive firms with old asset composition would almost always stand to gain since they would have lower asset values, lower depreciation expense, higher profits, and higher rates of return.¹¹ Such misguided evaluation of divisions and product lines may lead to suboptimal allocation of resources. Furthermore, inflated profits may give the appearance of prosperous business conditions, when, in reality, the opposite may be true. Such misleading HC reports may encourage managers to continue with inappropriate policies (e.g., production, pricing, and dividend policies) and may not develop and use effective and aggressive control measures when, in fact, the situation demands such steps.¹²

(4) The HC/ND basis may also have negative cash flow implications for

¹¹Little wonder, therefore, that so much of the opposition against ASR 190 came from executives of such firms. See, for example, Andrews (1976), Elia (1976), and Pappas (1977).

¹²These views have been expounded by Mathews and Grant (1958), Edwards and Bell (1961), and Chambers (1975) among others.

the firm. The inflated profits may put the firm at a disadvantageous position during wage negotiations, possibly resulting in paying higher benefits than the firm could afford under realistic income measurements. High reported profits may even lead government agencies to suggest new requirements that the firm can ill afford.

In summary, it appears that financial statements based on the HC principle may be misleading with far reaching consequences adversely affecting investors, creditors, and the firm itself.¹³

The Unit of Measure Principle

The HC/ND basis uses the dollar as the measurement unit with the assumption that it is a 'stable unit' with which to measure income. The experience of recent years, however, has shown that this assumption is no longer realistic.¹⁴ Unlike other units of measurement such as the ounce or the yard, the dollar is an unstable unit. Indeed, it is compared by some [Largay and Livingstone (1976)] with a 'rubber ruler.' This is so because the value of money, as a medium of exchange, is based on its ability to command goods and services (i.e., on its purchasing power). During infla-

¹³In support of this view, what Chambers [1975, p. 12] has to say might, perhaps, be convincing enough:

"It is impossible to say how much traditional accounting has distorted the judgements of managers and investors, to what extent it distorts the allocation of funds and real resources between firms and between industries, and how much inefficiency it has concealed for years. It has been said by some investigators and advisors in take-over negotiations that the managers of some large companies have had no idea of the total wealth of these companies, due to the out-of-date figures with which the accounts represent asset values. And it has been found on the failure of such companies as Atlantic Acceptance Corporation (Canada), Penn Central Transportation (USA), and Reid Murray (Australia), that investors and creditors, large and small, naive and sophisticated, have bought shares and made loans, which on the basis of a realistic accounting they should never have done."

¹⁴Even one of the most ardent supporters of the HC principle, (Ijiri, 1980) agrees with this view. However, Ijiri argues that this is not the fault of the HC accounting model but the fault of using the wrong measurement unit. Accordingly, Ijiri does not object to (and indeed welcomes) the HC/CD model which is discussed later on in this Section.

tionary periods, as the general price level (GPL) of goods and services rises, the purchasing power of money declines. The opposite is true with deflation. This raises a serious measurement problem: If the measurement unit is fluctuating in value, then the amounts at which costs and revenues are recorded and used in determining profits are not consistent. The monetary units used to record revenues at one point in time are different from those used at another point in time. Costs and expenses are likewise reported in monetary units which differ from one another and from those units used to measure revenues. The same applies to assets acquired at different dates. In short, the amounts are in mixed dollars and as such the resulting total cannot have a sensible meaning.¹⁵ This measurement problem inherent in the HC/ND basis causes some problems as discussed below.

Problems Caused by the Unit of Measure Principle and Its Assumption

The Unit of Measure principle and its underlying unrealistic 'Stable Monetary Unit' assumption inherent in the HC/ND basis render the financial statements unfit for analytical and comparative purposes. Normally, investors compare alternative investment opportunities and analyze past trends (such as growth in assets, sales, earnings, dividends, etc.) both on an inter- and intra-firm basis. However, because of the fluctuating measurement unit, no meaningful trend or comparative analysis can be made using the financial statements based on the HC/ND basis.

As a result of the problems caused by certain assumptions underlying the HC/ND basis as discussed above, 3 alternative reporting bases (HC/CD, CC/ND, and CC/CD) have been proposed to overcome those problems. These alternative bases are discussed below. First, an evaluation of the HC/ND basis is

¹⁵With an apparent touch of humor, Gynther [1962, p. 560] considered this process "as illogical as adding chestnuts to coconuts and recording the results as nuts."

in order.

Evaluation of the HC/ND Basis

Obviously, the advantages and disadvantages of alternative accounting reporting bases have to be analyzed in the light of the objectives of financial statements. SFAC No. 1 states that the major objective of financial reporting is to "provide information that is useful to present and potential investors and creditors and other users in making rational investment, credit, and similar decisions." (Para. 34).¹⁶

The above discussion clearly shows that the HC/ND basis is plagued with numerous disadvantages. This, however, does not mean that the HC/ND basis has no advantages. Proponents of the HC/ND basis list many advantages for it as presented in Exhibit D-1 in Appendix D which also presents a summary of the advantages and disadvantages of the 3 alternative bases discussed below.

The Historical Cost/Constant Dollar (HC/CD) Basis

The HC/CD basis uses a common or a constant measurement unit instead of the fluctuating nominal dollar. It uses an index (generally, the consumer price index) to restate the HC/ND financial statements into a HC/CD basis. Thus, the HC/CD basis does not necessarily convey CC or current value (CV).

The restatement process is motivated by the desire to overcome the reporting problems arising from the unrealistic 'stable monetary unit' assumption of the HC/ND basis. Thus, this restatement process leaves some defici-

¹⁶Ijiri (1980) disagrees with the above objective of financial reporting because, in his view, it is a "one-sided, decision-oriented" objective. That is, it focuses only on the interests of users of information and neglects the entity about which the information is prepared. Ijiri advocates an "accountability-oriented" view of financial accounting in which the accountant is described as a third party trying to balance the accountee (stockholders)' right to know and the accountant (enterprise)'s right to privacy. Conflict of interest in information flow is accepted as being natural under the latter view. Hence, emphasis is placed on supplying objective information that can withstand the pressure which is likely to be placed on it by varied interested parties. It should be noted that Ijiri's accountability-oriented view disregards the users of financial information other than the stockholders (such as potential investors and creditors, and other users) which the FASB's decision-oriented view takes into consideration.

encies of the HC/ND basis unresolved, namely, those arising from variations in prices and values of individual assets of specific firms. Furthermore, there is some difficulty in interpreting the restated amounts. [See, for example, Hendriksen, 1977, pp. 231-32].

There are also those who believe that the restatement process can only result in accounting getting away from reality [See, for example, Gynther, 1974, p. 141].

In spite of its shortcomings, however, the HC/CD basis has its proponents who believe that it provides 'more' realistic financial statements in comparison to the HC/ND statements.¹⁷ These proponents list other advantages as shown in Exhibit D-1 in Appendix D. Furthermore, the HC/CD basis has been seriously considered and sponsored by several authoritative accounting bodies, both in the U.S. and abroad.¹⁸ While the support for the HC/CD basis abroad has waned, the FASB in the U.S. required it as one of the supplementary disclosures under SFAS 33.

Principles and Assumptions Underlying the HC/CD Basis

Both the HC/ND and the HC/CD bases have their roots in the stewardship approach to financial reporting. For decades one role of the external auditor has been to assure the absentee owner that the activities carried out by management during a period are reflected fairly in the financial statements. Thus, external auditors are concerned with safeguarding the interests of shareholders. The idea of stewardship is also included as one of the objectives of financial reporting in SFAC No. 1:

"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 en-

¹⁷ See Backer [1973, p. 118] and Stamp [1972, p. 17].

¹⁸ See, for example, AICPA (1969), FASB (1974), Institute of Chartered Accountants in Australia and Australian Society of Accountants (1974), and FASB (1979).

trusted to it. Management is periodically accountable to owners not only for the custody and safekeeping of enterprise resources but also for their efficient and profitable use and for protecting them to the extent possible from unfavorable economic impacts of factors in the economy such as inflation or deflation and technological and social changes." [Para. 50-52].

Even though the stewardship approach was used originally as a theoretical assumption under the HC/ND basis¹⁹, proponents of the HC/CD basis use the same approach to support their method. They argue that in order to protect the investment of the absentee owners, changes in the value of the purchasing power must be considered. Declines in the purchasing power are much a use of the entrusted funds as other expenses of the firm and should be reflected in the report on management performance. Gynther [1966, pp. 44-45] states:

"If it is felt that the whole purpose of accounting is to look after the interests of shareholders and proprietors, then it is almost certain that the use of one general index will be favored for profit determination purposes; so that the number of purchasing power units contained in the monies subscribed to the business by shareholders will be maintained throughout a period of changing prices."

Evaluation of the HC/CD Basis

The advantages and disadvantages of the HC/CD basis are summarized in Exhibit D-1 in Appendix D.

The Current Cost/Nominal Dollar (CC/ND) Basis

Proponents of the CC/ND basis argue that the relevant attribute to be measured and communicated is current value²⁰ not historical cost.²¹ They

¹⁹ This assumption was not discussed under the HC/ND basis because accountants generally agree about its traditional meaning as underlined above. It is discussed now because proponents of the HC/CD basis give a broader meaning to it as underlined in SFAC No. 1's quotation and as discussed above.

²⁰ While CV and CC are technically different (with the former normally referring to exit values and the latter to entry values), they are used interchangeably for the purpose of this dissertation.

²¹ For a further discussion of this issue, see Mathews and Grant (1958), Edwards and Bell (1961), Gynther (1966), Chambers (1966 and 1976), Revsine (1973), and Lucas (1981). For example, Lucas [1981, p.12] illustrates the

believe that this basis represents a significant improvement over the HC/ND basis whether there is inflation or not. Even in the absence of inflation, these proponents contend, prices of specific goods and services move at different rates and some even move in different directions.²² In view of the above, current value (CV) reports are believed to provide useful data for both internal and external decision making purposes.

However, there are two main areas of disagreement among current cost (CC) advocates: (1) whether CC would be measured in terms of entry or exit values, and (2) whether the increase in asset value should be considered an income or an increase in permanent capital.

As Backer [1973, p. 1] argues, "one problem with CV is that there is no well-defined concept for it. It may mean different things to different people, which poses the problem of which CV to use." For example, several CV concepts have been suggested including (1) current entry values (or current replacement costs), (2) current exit values (or net realizable value), and (3) multiple valuation measures.

To simplify the choice, SFAS 33 required the use of the CC (defined as relevance of measurements of current cost by a simple example: "Suppose that a neighbor has run out of cooking oil and asks to borrow some. You have an unopened bottle of oil which you purchased last week for \$2.60, although the price has since increased to \$2.95. Your neighbor insists on paying you. What would be a fair price? You know that you will be going to the supermarket in the next few days and would pick up a bottle of cooking oil without inconvenience. You conclude that \$2.95 would be a fair price because, with that amount of money, you can get back to the position you were in before helping out your neighbor. The original cost of the bottle you gave the neighbor is irrelevant because it is no longer enough to buy a bottle of oil." However, in fairness to those who argue for objectivity, it should be noted that Lucas's example is based on two basic and simplified assumptions: (1) homogeneity of products, and (2) availability of markets. These two conditions may not exist in all cases. Furthermore, Lucas did not explain what happens if by the time you went to the supermarket you found that the price of the oil bottle has gone up to \$3.05 or has gone down to \$2.90!.

²² For instance, in 1974 refined petroleum products went up 79.5% while animal feeds went down 26.5%, and the whole price index showed an increase of 16.4% [Sterling, 1975, footnote 10, p.48].

current entry value) of the assets owned, or net realizable value if lower. Moreover, SFAS 33 enhance flexibility by allowing the use of multiple measures for different assets.

As to whether the increase in asset values should be considered income, Burton and Sprouse (1976) agree that income can be operationally defined as any increase in owners' equity other than contributed capital. In this view, holding gains (the increase in asset value) is probably includable as income. Edwards and Bell (1961) hold the same view. They argue that management decisions affect both operating profits and holding gains. Thus, in order to accurately measure management performance both (operating profit and holding gains) must be reported on the income statement. Another school of thought treats the increase in assets as a capital maintenance adjustment in the balance sheet without going through the income statement.

To get around this problem, SFAS 33 requires the disclosure of the increase in assets on the face of the supplementary income statement adjusted for the effect of changing prices but not added in as a part of current operating income (COP) from continuing operations.

Principles and Assumptions Underlying the CC/ND Basis

1. One of the assumptions underlying the CC/ND basis [as well as the CC/CD basis -discussed later on- , both loosely known as current value accounting] is the Hicksian definition of income. Hicks [1946, p. 172] defines income as "the maximum amount which a man can consume during a week, and still expects to be as well off at the end of the week as he was at the beginning." In other words, before income can be recognized, allowance must be made for the cost of assets used up in the process of creating income.
2. A second assumption underlying CV accounting is that income is being earned continuously as the products move through the stages of production toward their eventual sale and as the prices of other assets and liabilities change.

[Largay and Livingstone, 1976, p. 123]. This is in contrast to the traditional realization concept under which revenue is reported only when an exchange process has occurred, i.e., when goods or services have been transferred to a customer giving rise to either receipt of cash or a claim to cash or other assets. That is, in the traditional concept, generally, no realization takes place as a result of holding assets or of the purchasing or the production processes alone.²³

3. The matching principle is also cited in support of CV accounting. [Carlson, 1973, p. 35]. Under the matching principle, costs are matched against revenue realized during a period in order to determine the period income derived from that revenue. CV advocates argue that this principle implies that costs and revenues should be in the same terms (time-wise) in order to determine an appropriate periodic income. Under the HC/ND basis, certain costs, notably cost of goods sold and depreciation, are not in equivalent terms with the matched revenue.²⁴

Evaluation of the CC/ND Basis

The advantages and disadvantages of the CC/ND basis are summarized in Exhibit D-1 in Appendix D. However, the specific benefits of the CC/ND as well as the CC/CD basis to lenders' decision making are discussed in detail in Chapter IV.

A Closer Look at the Disadvantages of the CC/ND Basis

The CC/ND basis disadvantages summarized in Exhibit D-1 in Appendix D would seem, if accepted, to be in contradiction with the theoretical back-

²³ APB Statement No. 4 (para. 149) recognized that "Most types of revenue are the joint result of many profit-directed activities of an enterprise and revenue is often described as being 'earned' gradually and continuously by the whole of enterprise activities. Earnings in this sense is a technical term that refers to the activities that give rise to the revenue--purchasing, manufacturing, selling, rendering services, ..., and so forth. All of the profit directed activities ... that comprise the process by which revenue is earned may be called the earning process." However, the Statement goes on to state (in para. 150) that "revenue is conventionally recognized at a specific point in the earning process ... usually when assets are sold or services are rendered." Proponents of the CC/ND basis argue that revenue should be recognized gradually throughout the earning process and not only at its end.

²⁴ See also footnote 8.

ground of SFAS 33. Consequently, a further discussion of these disadvantages is necessary here.

A closer look at these disadvantages reveals that they are either illusionary or may be avoided by adjusting the figures to a CC/CD basis (discussed later on).

The most-often cited disadvantage of the CC/ND basis (as well as the CC/CD basis) is the injection of subjective and hypothetical data into financial reporting and that this may increase the potential for manipulation of the data.

Johnson and Bell [1976, pp.68-69] claim that CC is less subjective than HC. They cite two examples to support their view: inventories and depreciation. Under HC, cost of goods sold could vary considerably depending on whether a FIFO or LIFO cost-flow assumption is made. Under the HC/ND basis, there are no objective criteria to determine which cost-flow assumption should be used. Therefore, the decision is a subjective one. Under CC, there are no cost-flow assumptions. Johnson and Bell feel that the difference between CC of goods sold arrived at by different accountants would not be nearly as great as the difference between the FIFO and LIFO figures.

As for depreciation, under the HC/ND basis, estimates of service lives and salvage values can vary widely among firms (for similar assets). Furthermore, there is the problem of different depreciation methods which influence the amount of depreciation expense. Under Edward & Bell (1961)'s CC system, depreciation is measured by the difference between the CC of a new asset and the CC of a used asset, a much less subjective computation than that of the HC/ND basis.

Storey [1981, p. 3] argues that CC may be as reliable as (if not more reliable than) HC:

"Costs of goods sold that have resulted from several allocations within a cost accounting system as well as a cost-flow assumption (such as FIFO or LIFO) or depreciation expenses that have resulted from a straight line or sum-of-years-digits allocation procedure are not verifiable, and we have no way of knowing the extent to which they faithfully represent or fail to represent the cost of goods sold or the depreciation during the period. As FASB Concepts Statement No. 2 (para. 81-89) notes, only the methods for obtaining these results are verifiable, not the results themselves."

Storey argues further that almost everybody knows that revenues result from the whole process of buying, converting and selling assets and services and collecting the selling price and yet the present accounting model assumes that revenues result only from the act of sale. He proceeds to say:

"My point is that cost deferrals created in the existing model by delaying revenue recognition make the result much less reliable than we usually admit, perhaps as unreliable or more unreliable than those of the earlier recognition. I emphasize that point because it seems not well understood probably because it is obscured by the widely accepted myth that 'historical costs are more objective or more verifiable than current costs or current values.'"

Largay and Livingstone [1976, p.212] hold a similar view:

"The degree of subjective estimates [in CV accounting] may be not more severe than many subjective estimates which provide the basis for conventional financial statements--such as useful lives of assets, or percentage-of-completion approximations. We may forget how subjective some of these estimates are, simply because long usage and custom have made us feel safe or comfortable with them. CV estimates may be no more subjective, just less familiar and thus somewhat intimidating."

Another disadvantage of the CV accounting, though not as widely cited as the first, is the fear that its adoption may seriously affect the capital market by shifting resources away from certain industries. One study of the Dutch companies using CV accounting [Backer (1974)] has suggested that the cost of equity capital and business acquisitions may be adversely affected by understated earnings and market price per share. Some proponents of the CV bases consider this an advantage rather than a disadvantage. [See footnote j to Exhibit D-1 in Appendix D].

The last three disadvantages of the CC/ND basis listed in Exhibit D-1 may be eliminated by adopting the CC/CD basis discussed below.

The Current Cost/Constant Dollar (CC/CD) Basis

A careful examination of the arguments for and against the HC/CD and CC/ND bases reveals that most of the criticism of these two bases of accounting for the effect of changing prices could be overcome by combining the two bases. Because the HC/CD basis deals with the measuring unit and the CC/ND basis deals with the attribute being measured, there are no theoretical obstacles to combining the two bases.

Sterling [1975, pp. 42-51] supports the CC/CD basis, which he refers to as CV, by arguing that command over goods is the relevant attribute that should be measured and communicated. In his view, even though the balance sheet amounts under the CC/ND basis indicate command over goods, the income statement under that basis needs to be adjusted for changes in the general price level, i.e., it must be restated to a CC/CD basis. This view is supported by Chambers [1975, p. 62], Largay and Livingstone [1978, pp. 65-71], Vancil [1976, pp. 58-67], and Brooks and Buckmaster [1977, pp. 60-65].

However, the CC/CD basis is not without opponents. Proponents of the CC/ND basis oppose any restatement to CD whether under HC or CC. For example, Gynther [1974, p. 144] states that "there is no such a thing as 'purchasing power unit' that could be used more meaningfully than the unstable dollar." He argues that since the purchasing pattern of entities and individuals is different and that inflation affects prices of goods and services in different ways and magnitudes, the purchasing power of the dollar will vary among entities and individuals. Ryan [1972, p. 385] holds the same view.

Principles and Assumptions Underlying the CC/CD Basis

It was shown earlier that the principles and assumptions underlying

the HC/CD basis are the same as those underlying the HC/ND basis with the exception of the stable monetary unit (the dollar). Likewise, the principles and assumptions underlying the CC/CD basis are the same as those underlying the CC/ND basis with the same exception. Thus, the principles and assumptions underlying the CC/CD basis include: (1) the Hicksian definition of income, (2) that income is earned continuously throughout the stages of production, sale and collection of sale prices, and (3) the matching principle. There is no need to repeat the discussion of these assumptions here since they were discussed in detail under the CC/ND basis.

Evaluation of the CC/CD Basis

The advantages and disadvantages of the CC/CD basis are summarized in Exhibit D-1 in Appendix D.

Section Two below presents a review of some empirical research studies.

Section Two

Review of the Empirical Research Studies

This section presents a critical review of some research studies which attempted to test whether there is an empirical evidence supporting the advantages or the effects of the alternative reporting bases, particularly the HC/CD and the CC/ND (or RC) bases. For convenience of exposition, the review is divided into five parts: Part (A) presents a review of empirical studies investigating the effects of the adjustments for changing prices on the elements of financial statements and the ratios based thereon; Part (B) covers studies investigating the ability of income measurements adjusted for changing prices (vis-a-vis the HC/ND income) to predict an object or an event of interest (e.g., future income, future cash flow, business failure, etc.); Part (C) presents a review of studies examining the perceived usefulness (by preparers and various

user groups) of accounting data adjusted for the effects of changing prices; Part (D) covers studies showing the usefulness and ranking (by various user groups) of accounting data adjusted for the effects of changing prices relative to other information items; and Part (E) covers studies investigating the actual effects of the adjustments for changing prices on decisions. The capital markets studies (i.e., those investigating the effects of CD and CC data on stock price and volume movements or those showing the degree of association between market betas and HC-, CD-, or CC-based accounting betas) are not reviewed here since the present study focuses on the effects of CD and CC data on individual users' (rather than on aggregate) decisions. Likewise, studies investigating the effects of CD and CC data on internal (managerial) decisions (i.e., decisions of controllers, chief financial officers, and management of corporations in general) are not reviewed here since the present study focuses on external users' decisions. Also, simulation studies are not reviewed since this section focuses on empirical studies.²⁵ Furthermore, studies includable in Parts (A) through (D) are not directly related to the focus of the present study and therefore are summarized only in a table format showing the focus and conclusion of each study. A brief comment on the studies covered in each table taken as a whole is made. Part (E) is the main focus of this section where a special emphasis is placed on those studies whose objectives are closest to the objective of the present study (e.g., studies investigating the effects of CD and CC data on lending decisions rather than on investment decisions).

²⁵ Readers interested in studies not reviewed here are referred to Frishkoff (1982) for a good bibliography and a summary.

Part (A) Studies Investigating the Effects of Adjustments for Changing Prices on the Elements of Financial Statements and Ratios

The studies investigating the effects of adjustments for changing prices on the elements of financial statements and ratios based thereon indicate, as summarized in Table II-1, a significant impact of inflation on these elements and ratios. These results were not unexpected. The inflation rates in the period covered by these studies were relatively high. Even though

Table II-1

Summary of Studies Investigating the Effects of Adjustments for Changing Prices on the Financial Statements Elements and Ratios

Study	Focus	Conclusion(s)
Kratchman et al (1974)	The effect of alternative income concepts (HC/ND; HC/CD; CC/ND; and CC/CD) on the firm's performance (as measured by return on assets and return on equity)	With respect to return on assets, any income concept is a surrogate for the other concepts in measuring a firm's performance. This is not true with respect to return on equity, and in particular, HC income is not a surrogate for CC income and vice versa
Hartman (1975)	The effect of specific price level adjustments Vs. HC on 5 financial ratios	The accounting method (RC vs. HC) has a significant effect on profit generating potential ratios (asset turnover, profit as a % of sales, and return on investment) but not on liquidity-solvency ratios (current ratio and times-interest-earned)
Parker (1977)	The impact of GPL Adjustments on the financial statements of 1050 U.S. companies	The impact of inflation varies greatly among individual firms and industry groups
Price Waterhouse (1980)	The effects of SFAS 33 disclosures on: net income, return on net assets, dividend payout ratios, tax rates, and growth rates of sales, dividends, and stock prices of 215 companies	There is a tremendous impact on the first 4 statistics of non-financial companies. There is also a significant impact on the growth rates of all companies including the financial group

KEY: GPL: General Price Level ; GPLA: General Price Level Adjusted ; HC: Historical Cost ; CC: Current Cost ; RC: Replacement Cost ; CD: Constant Dollar ; ND: Nominal Dollar ; SFAS: Statement of Financial Accounting Standard.

the focus of this study is on the effects of the inflation adjusted accounting data on lending decisions, it was necessary to document the significant changes in the accounting data themselves. Had the accounting data not changed significantly, decisions based on these data would not have been expected to change significantly, if at all.

Part (B) Studies Examining the Predictive Ability of Data Adjusted for Changing Prices Vis-A-Vis the HC Data

Whereas the studies summarized in Part (A) focused on the impact of adjustments for changing prices on the financial statements elements and ratios, the studies summarized in this Part focus on the ability of the adjusted data - vis-a-vis the HC data - to predict an object or an event of interest. These studies examining the predictive ability of inflation-adjusted data indicate mixed results as summarized in Table II-2.

Part (C) Studies Assessing the Perceived Usefulness of Accounting Data Adjusted for the Effects of Changing Prices

This Part presents a review of studies using questionnaire and interviews to assess the usefulness of accounting data adjusted for changing prices as this usefulness is perceived by preparers and various groups of financial statement users. Table II-3 presents a summary of these studies.²⁶ A review of this table reveals that, with the exception of the first and last studies in the table, all studies show that both CD and CC data are perceived by both preparers and the various users of financial statements as not useful but perhaps confusing and/or misleading. One of the possible reasons why the first study by Estes (1968) showed that both CD and CC data are perceived (by various user groups) to be useful is that he emphasized that respondents should assume that CC data could be accurately

²⁶ It should be noted that of the 9 studies summarized in the table 4 were published in 1978 alone. This is probably due the fact that in that year there was a heated discussion of the subject as the FASB issued a Discussion Memorandum, an Exposure Draft, and conducted a public hearing that eventually led to the issuance of SFAS 33 in September 1979.

Table 11-2

Summary of Studies Examining the Predictive Ability of
Data Adjusted for Changing Prices Vis-A-Vis HC Data

Study	Focus	Conclusion(s)
Frank (1969)	The ability of each of HOP and COP to predict its own future value or future value of HOP	1. HOP's prediction of future HOP is better than COP's prediction of future COP. 2. There is no difference between HOP's & COP's prediction of future HOP. However, in the oil and chemical industries, COP may be of assistance in predicting future HOP.
Ketz (1978)	The utility of GPLA data vs. HC data in predicting business failure using financial ratios	1. Both GPLA and HC data were equivalent from the criteria of R^2, overall error rates, and error rates of misclassifying non-failed firms. 2. GPLA outperformed HC in terms of error rates of misclassifying failed firms & expected cost of misclassification.
Scott (1978)	The ability of current value (CC) data vs. HC data to predict cash flow	CV results of operations is a better predictor (than HC data) of future operating cash flows among all 4 test companies and across a wide variety of sales volume trends and rates of inflation
Prakash and Sunder (1979)	The case against dichotomy of income into COP and HC. Also, the stability and predictive ability of COP vs. HOP	1. The variability of HOP & COP is almost equal. However, for one-period changes, COP is slightly less stable than HOP. 2. For the period 1929-49, HOP outperforms COP in predicting next year's COP. However, for 1929-74, there is no difference in the predictive ability of HOP and COP. 3. (2) is repeated for 1st differences.
Norton and Smith (1979)	A comparison of the prediction of bankruptcy based on GPLA financial ratios and that based on HC financial ratios	Both GPLA and HC financial ratios exhibited the ability to predict bankruptcy. However, little difference was found in the prediction of bankruptcy using each set of ratios. Using 4-year data, GPLA ratios were consistently neither more nor less accurate than HC ratios in bankruptcy prediction
Baran et al (1980)	The usefulness of HC, GPLA, and HC-GPLA data in the prediction of bond rating	Bond rating predictions based on GPLA data are slightly better than those based on HC data. However, using HC & GPLA data combined provides a greater improvement in bond rating predictions over those based on HC data alone
Ismail (1981)	The ability of alternative measures of income (HOP; COP; and COP+HC) and CF to predict future CF	1. HOP outperformed COP in predicting future CF in all cases. 2. HOP also outperformed COP+HC except in 2 cases: auto-parts firms and 1977 manufacturing. 3. COP+HC outperformed COP in the majority of cases. 4. HOP and CF had equal predictive ability except in 3 cases (drug firms, grocers, and 1977 retail) in which HOP outperformed CF.

COP: Current Operating Profit; HC: Holding Gains or Losses; GPLA: General Price Level Adjusted; GPI: General Price Index; SPI: Specific Price Index.

Table II-3

Summary of Studies Assessing the Perceived Usefulness (by Preparers and Various User Groups) of Accounting Data Adjusted for Changing Prices

Study & Research Methodology	Focus	Subjects Responding	Conclusion(s)
Estes (1968) [Questionnaire]	Assessment of the usefulness of CC and GPLA data by financial Statement users	99 Financial Analysts (CFAs) 143 Bank Loan Officers (BLOs) 96 Financial Executives (FEs)	82% & 70% felt that CC & GPLA respectively were "very" or "somewhat" useful. The percentages were 90% and 80% respectively. The percentages were 67% and 56% respectively
Backer (1970) [Interviews]	Importance of Financial Reporting (including RC and GPLA data) to Security Investments and Credit Decisions	72 CFAs 74 BLOs 109 FEs	All but one opposed adjustments for inflation in <u>primary</u> F/S. All opposed accounting for inflation even as supplementary data. All but 4 opposed accounting for inflation.
Brenner (1970) [Questionnaire]	Financial Statement Users' Views on the Desirability of including CC data in computing EPS	484 Stockholders 340 BLOs 417 CFAs	38% opposed computing CC-EPS. 57% "disagree" or "strongly disagree" with CC-EPS. 80% "disagree" or "strongly disagree" with CC-EPS
Backer (1973) [Interviews]	The mechanics and feasibility of Current Value (CV) accounting	Representatives of one company; 4 CFAs and few BLOs in the Netherland	Financial analysts prefer HC over CV. Bankers had no strong feeling on the matter
Benston & Krasney (1978) [Questionnaire]	The Demand for alternative accounting Measurements (RC; CV; PV; & GPLA) for 17 information items	Life Insurance Co. Officers: 61 Direct Placement (DP) & 57 Common Stock investment (CSI)	DPs overwhelmingly chose HC; CSIs did also but not so strongly. DPs acknowledged using alternative measurements, especially RC for specific assets (e.g., inventory & PPE and related expenses).
Frank et al (1978) [Interviews & Questionnaire]	The effects and usefulness of ASR 190 RC disclosures	530 Corporate Executives (Interviews made with 40) 222 Financial & Credit Analysts (Interviews made with 18)	86% felt that ASR 190 RC data were not useful to analysts; 85% felt RC data were potentially confusing or misleading; 78% felt RC data were not useful for internal decisions. 44% found RC data "very" or "somewhat" useful; 82% felt data were confusing or misleading; 51% preferred HC to account for inflation; 25% felt that RC data led to "tempered conclusions."

Table II-3 (Continued)

Study and Research Methodology	Focus	Subjects Responding	Conclusion(s)
O'Connor & Chandra (1978) [Interviews & Questionnaire]	The importance of RC disclosures	600 Corporate Executives (Interviews made with representatives of 9 companies) 80 CFAs (No Interviews)	Both interviewees and respondents to the questionnaire generally doubted that ASR 190 RC data would be useful, either internally or externally. Most felt that RC data were not the best solution for reporting inflation effects in the financial statements. There was apparently no agreement on what <u>is</u> the best solution.
Robert Morris Associates (1978) [Questionnaire]	Importance of Alternative accounting measurements (GPLA & CC data) for bank lending decisions	100-125 Experienced BLOs	Almost all felt that additional accounting information (e.g., GPLA or CC) would not have led to the avoidance of any material losses in the past 5 years. Any changes desired would be merely minor fine-tuning, more details of things such as aging of receivables & payables; FIFO-LIFO comparisons; and cash flow analysis, etc.
Louis Harris Associates (1980) [Interviews]	A study of the attitudes toward and an assessment of the FASB (including SFAS No. 33)	88 Chief Financial Officers of large Companies; 55 Chief Executive Officers of very large Co.s; 54 Officers of Securities Firms; 30 Academics; 42 Government Officials; 27 Members of the Financial Press; 84 Officers of various-sized accounting firms; and 35 Chief Executive Officers of smaller Co.s	With respect to a question dealing with imminent changes in financial reporting: 61% of respondents (as a whole) felt that CC would slowly become more important than HC should inflation continue & over 75% felt this to be a positive trend. While 84% expressed familiarity with SFAS 33, only an average of 43% [ranging from 48% to 37%] felt that SFAS 33 is "sound and wise". Most of FEs and heads of smaller accounting firms felt that SFAS 33 was "not sound".

KEY: HC: Historical Cost ; RC: Replacement Cost ; CC: Current Cost ; GPLA: General Price Level Adjusted ; FV: Present Value (capitalization) or future (undiscounted) cash flows ; EPS: Earnings Per Share ; PPE: Property, Plant & Equipment.

and objectively determined. Most of those who perceive CC data as not useful would argue that the most important problem with CC data is that this assumption is not realistic. As to the last study in the table, Harris (1980), [which is the only study conducted after SFAS 33 has already been issued], it is possible that by the time the interviews were conducted many of the interviewees have become familiar with the data adjusted for inflation. Furthermore, at that time the inflation rate was relatively higher than when the other studies summarized in the table were conducted.

Part (D) Studies Examining the Usefulness and Ranking (by Various User Groups) of Accounting Data Adjusted for the Effects of Changing Prices Relative to Other Information Items

This part reviews empirical studies examining the usefulness and ranking (as given by various financial statement users) of accounting data adjusted for the effects of changing prices vis-a-vis other items of financial information. All these studies used questionnaire in which a fairly long list of information items is given to the subjects in a specific user group who are asked to rate the usefulness of each item on a 5-point scale [0 through 4 or 1 through 5] in the context of some criterion of usefulness as specified by the researcher. Table II-4 presents a summary of these studies.

A look at Table II-4 reveals that even though the inflation-adjusted information item was ranked either last or near last in all studies, it was given a score near the arithmetical midpoint (2 or 3 depending on whether a 0-4 or 1-5 scale was used) which is usually labeled something like "of some usefulness." This may indicate a reluctance or an inability on the part of respondents to rate any information item as unimportant. That is, respondents are either reluctant to throw any kind

Table 11-4
Summary of Studies Examining the usefulness and Ranking (by Various User Groups) of Accounting Data Adjusted
for the Effects of Changing Prices Relative to Other Information Items

Study	Focus	Inflation-Adjusted Information Item Rated	Subjects Responding	No. of Items Rated	Rank of Item in Column 3	Usefulness of Item in Col. 3 Score ^a Meaning
Buzby (1974)	Selected Items of Information and Their Disclosure in Annual Reports	Information on the Effects of Changing Price Levels, Such as Indices or supplementary CPA Statements	144 CFAs	38	28	2.9 ^{bc} Useful
Chandra (1974)	The Consensus on Disclosure among Public Accountants & Security Analysts	Value of CPA to CFAs " " " in investment decisions " " " " " "	159 CFAs 159 CFAs 180 CFAs	58 58 58	56 55 Last	3.1 ^{abc} 3.1 ^{abc} 2.9 ^{abc} [Somewhat Useful]
Falk et al (1976)	Disclosure for Closely Held Corporations	Effects of Price Level Changes and Adjustments	238 BLOs	43	39	2.2 ^a Somewhat Useful
San Miguel & Stephens (1976)	Differential Weighting of Financial Information by User Groups	Supplementary CPA Statements	100 CFAs 100 BLOs	58 58	Last 52	2.8 ^{abc} 3.0 ^{abc} [Somewhat Useful]
Stanga (1976)	Disclosure in Published Annual Reports	Financial Statements Adjusted for Changes in purchasing Power	272 CFAs	79	Last	2.0 ^a Somewhat Useful
Benjamin & Stanga (1977)	Differences in Disclosure Needs of Major Users of Financial Statements	Financial Statements Adjusted for Changes in purchasing Power	208 BLOs 207 CFAs	79 79	71 72	2.2 ^a 2.1 ^a [Somewhat Useful]
Chandra & Greenball (1977)	Management Reluctance to Disclose	Value of CPA to CFAs " " " in investment decisions " " " " " "	155 FEs 158 FEs 180 CFAs	58 58 58	Last Last Last	2.7 ^{abc} 2.8 ^{abc} 2.9 ^{abc} [Somewhat Useful]
Stephens (1978)	Uses of Financial Information in Structuring & Improving Decision Processes of Bank Loan Officers	Price Level Adjusted Corporate Annual Reports as Supplementary Statements	29 BLOs	58	Ties With Last	3.0 ^{abc} [Somewhat Useful]

^a On a 5-point scale from 0 to 4.

^{bc} On a 5-point scale from 1 to 5.

KEY: CPAs: General Price Level Adjusted ; CFAs: Chartered Financial Analysts ; CPAs: Certified Public Accountants ; BLOs: Bank Loan Officers ; FEs: Financial Executives.

of information totally away²⁷ or they believe that having an information item (even though they may not use it in making their decisions) is better than not having it. This point will be elaborated on in Chapter III with respect to bank loan officers, the subjects in the present study.

Part (E) Studies Investigating the Effects of Adjustments for Changing Prices on Decisions

Because the studies investigating the effects of adjustments for changing prices on decisions are similar in many respects to the present study, they are reviewed in detail in this part. Since studies examining the effects of inflation-adjusted data on lending decisions relate more closely to the objective of this study, special emphasis is placed on such studies. However, most of the available research pertains to the effects of inflation-adjusted data on investment rather than on lending decisions. Following is a detailed review of these studies.

²⁷ Frishkoff [1982, p. 7] argues that this may be so because there is no "cost" of an incorrect response. In a less artificial setting, the respondent has to allocate at least time, if not money, to choosing among competing sources of information.

Dyckman (1969)

Dyckman (1969) attempted to measure the extent to which decisions of financial analysts are affected when GPLA data are used as a decision base.

He constructed financial statements for two hypothetical companies. One company had much older fixed assets and a larger current ratio than the other; [under GPLA accounting, this company reports a smaller net income, primarily because of higher depreciation charges and a net holding loss from holding net monetary assets]. The financial statements of the 2 firms were restated to GPLA (using the GNP-IPD). Three different measurement bases were used by 3 groups of members of the Financial Analysts Federation: (1) both firms using HC, (2) both firms using HC plus supplementary GPLA data, and (3) both firms using GPLA data only. The subjects were asked to choose which company could have higher market offering price in a proposed new issue.

Dyckman found that, numerically, more analysts placed a higher market price on the firm with relatively newer fixed assets and lower current ratio. Moreover, the subjects indicated a strong preference for supplementary GPLA data rather than for GPLA data as the primary statement form. Though the correlation between investment choice and reporting method was statistically significant, it was not very strong. Dyckman concluded that GPLA financial statements used alone or in conjunction with HC can influence relative investment evaluations, even though not strongly.

There seems to be no critical limitation of Dyckman study. A minor limitation is that he used two completely hypothetical firms. Whether these hypothetical firms approximated real life firms is debatable. That is, in constructing hypothetical firms, one can go to such an extreme that it may be difficult to determine whether that extreme approximates the real world.

McIntyre (1973)

McIntyre (1973) attempted to determine the usefulness of RC information

to investors in common stock.

He conducted a laboratory experiment where 33 undergraduate and 37 graduate students were given the F/S of 4 actual companies (with their names disguised) from one industry (Tire and Rubber) for 3 years. The subjects were classified into 3 groups where group 1 received HC data only; group 2 received RC data only (with net income adjusted to end-of-year dollars); and group 3 received both HC and RC information.

The subjects were asked to select the company which is the preferable investment and to place a value for the common stock for each of the 4 firms.

Using Fisher exact probability test for 2x2 contingency tables, 2-way ANOVA, and Chi-square tests, McIntyre concluded that subjects receiving only RC statements did not perform any better than subjects receiving only HC statements. However, the majority of subjects receiving both HC and RC data indicated that they believed the additional RC statements were useful in their analysis.

McIntyre study is subject to a number of limitations including:

1. Students subjects may not be good surrogates for real decision makers.²⁸
2. The use of the market price to determine the goodness of subjects'

decisions is not a good choice to test for the effect of financial

²⁸Abdel-Khalik [1974, p.750], examining the efficiency of student surrogation for bank lending officers, found that: "(1) the frequency distributions of students' decisions were statistically dissimilar to the bankers' decisions in about one half of the tests performed; (2) the directions of the differences between means and the relationships of the magnitudes of the means are not patterned in any systematic way; and (3) students' decisions were less dispersed than bankers' decisions in 37 out of 40 cases which might suggest a substitution of a textbook approach for one having a quite diversified experience." He concluded that "until such conditions [under which surrogation would not entail a great sacrifice in describing the behavior of actual (or real) decision makers] are known, generalizing from student responses to real-life decision making should not be encouraged. Furthermore, Pankoff and Virgil (1970) found that though financial analysts were erratic in their ability to forecast stock prices from period to period, their forecasts much outperformed those of MBA students who were used as a control group.

statement information on decisions since the market price can be influenced by many other factors such as interest rates and political events worldwide.²⁹

3. Although the RC adjustments (made by the researcher) produced substantial changes in the earnings of all firms, the position of each firm in relation to the other firms used in the study remained much the same as it was before RC adjustments (e.g., in terms of EPS, ROI etc.). Given this problem in the research design the results obtained were not unexpected.

Heintz (1973)

Heintz (1973) attempted to determine the effect of GPLA data on investment decisions. His study was similar to that of McIntyre (1973) in almost all respects (objective, design, subjects, and results) except that he used GPLA rather than RC data.

He conducted a laboratory experiment where 74 graduate and 9 undergraduate students (majoring in accounting or finance) were provided with the financial statements of 3 actual companies (with their names disguised) from different industries. At the beginning of a hypothetical period, all subjects received the same industry, general economic, market price, and dividend information. However, each subject received the company's F/S in only one of 3 forms: HC, GPLA, or both.

In an attempt to replicate reality, each student was hypothetically "given" \$15,000 to allocate to investments. The subjects were asked to forecast the end-of-period stock price for each company and to make some investment decisions. At end of the hypothetical period, after the forecasts and decisions were completed, each subject was informed of the results for the period, his investments were liquidated, and the investment cycle began again. This procedure continued for a maximum of 4 hours, which enabled a subject to complete from 3

²⁹ Choosing the amount the decision maker is willing to invest in the company and/or his estimate of the company's risk (e.g., probability that it will default on a loan within a given future period) as dependent variables would have been a better choice.

to 8 periods, depending on his decision making pace.

Using ANOVA and t-tests for the equality of means, Heintz found that, with the exception of one period (period 4), subjects using only GPLA or both GPLA and HC data did not make forecasts different from those made by subjects using only HC data. Heintz attributed the difference among the 3 groups' forecasts in period 4 to the shock of the initial decision experience and concluded that the forecast differences had nothing to do with any differences between HC and GPLA information.

Heintz study is subject to the same limitations of McIntyre (1973) study. Furthermore, providing all 3 groups with the same market price per share may have biased the results toward no difference in forecasted end-of-period market price. That is, subjects may have placed a greater weight to the market price per share than the weight they placed to the differences between HC and GPLA data.

McEnroe and Nikolai (1979)

McEnroe and Nikolai (1979) attempted to determine whether access to RC data (as required by ASR 190) and the form of presentation of these data each has an impact upon the evaluation of investor decision criteria.

Three firms were randomly selected from a capital intensive industry (machinery and equipment) for each of which 3 information partitions were created: (1) HC only, (2) HC plus a footnote on RC data, and (3) same as (2) plus income statement based on RC data. Fifteen students (both accounting and non-accounting majors) were used as surrogate for unsophisticated users of financial statements. The subjects were randomly assigned to data partitions and were asked to first carefully analyze the annual reports for the purpose of determining the desirability of a common stock investment, and

to evaluate each of 17 investment criteria³⁰ on a 9-point scale from very good to very poor.

Using a 2-way ANOVA on a 3x3 factorial design, McEnroe and Nikolai found that there are no significant differences in the evaluation of the desirability of a firm as a function of either the content or the form of the accounting information received. They concluded that:

1. the SEC's argument for including RC data in annual reports because they will materially assist financial statement users and improve investment decision making is weakend, and
2. the SEC's caveat concerning the disclosure of the impact of RC data via a supplemental income statement on the 10-K form may be unwarranted since this disclosure format did not affect unsophisticated investors' decisions.

McEnroe and Nikolai study is subject to a number of limitations, the most important of which are the following:

1. The use of students as surrogate for investors may have been a poor choice. Even though the researchers claim that students are good surrogate for unsophisticated investors, students may lack the experience³¹ and motivation of real investors. Paying \$3 to each student for his/her participation is hardly a motivating factor.
2. The sample of 15 subjects was a very small one and generalization of

³⁰The 17 investment criteria were: overall profitability of the company, its overall financial strength, future prospects for real earnings growth, potential for increased common stock dividend payments, the risk of insolvency, opportunity for increased return on investment (capital gains), the risk of declining future earnings, ability to fund future expansion, the dividend to earnings ratio, the cash flow from operations calculation, the total increase or decrease in cash flow, the debt to total stockholders' equity ratio, the return on total assets, the primary and fully diluted earnings per share, the return on total stockholders' equity, the ability to meet upcoming debt maturity, and the price earnings ratio.

³¹See footnote 28.

the results may be very limited.

3. The experiment package (including the netire unabridged annual report, and the requirement of evaluating 17 different investment criteria) may have been simply too large to handle even by expert financial analysts (let alone students). This may have resulted in a very artificial task.

Stone (1980)

Stone (1980) conducted a study similar to McEnroe and Nikolai (1979) in almost every respect (objective, design, subjects, tests, conclusions and limitations) as summarized in Table II-5. Accordingly, there is no need for any further discussion of Stone's study.

Diamond and Arnold (1979)

Diamond and Arnold (1979) study is considered last and analyzed in greater detail because its objective is the closest to that of the present study.

Diamond and Arnold attempted to determine the effect of RC data on bank lending decisions. The specific objective of Diamond and Arnold study was to determine (1) the effects of supplemental RC data on bank loan pricing decisions, and (2) the extent to which bank lending officers (BLOs) actually use these data in making their individual pricing decisions.

100 BLOs from 6 California banks participated in the study in addition to an executive from each bank who served as a consultant to the study.

Each BLO was requested to evaluate a set of 5 financial ratios³² for each of 40 independent firms (from 4 industries ranging from high to low capital intensity³³) and to recommend an interest rate at which the loan³⁴

³²The 5 financial ratios used were: current ratio, debt to net worth, times-interest-earned, pretax income to total assets, and percent change in pretax income.

³³The 4 industries were: Steel, Tire & Rubber, Industrial Manufacturing, and Textile Apparel Manufacturing.

³⁴The dollar amount of the loan was 5% of the borrower's common stockholders' equity, provided that was between \$1 million and \$50 million.

requested by each firm would be granted. Half of the BLOs made decisions based on HC ratios while the other half made decisions based on both HC and RC ratios. Using ANOVA, multiple regression analysis, and Hartley's test, Diamond and Arnold found the following:

1. Differences between decisions made by BLOs receiving HC ratios and by those receiving HC and RC ratios were not statistically significant.
2. RC ratios did not have a different effect across industries.
3. There was no significant difference in consensus (as measured by the variance of the decisions) between groups.
4. RC ratios were substantially ignored by BLOs in making their decisions.
5. When asked to evaluate the usefulness of RC ratios subjectively, BLOs consistently indicated that the ratios had little effect.

Diamond and Arnold study is subject to a number of important limitations. Because of the obvious similarity between their study and the present study, most, if not all, of these limitations will be avoided in this study as discussed at end of each limitation below:

1. Even though the main conclusion of the study is that RC disclosures have no effect on lending decisions, a sub-conclusion of the study (i.e., that BLOs did not use RC ratios in making their decisions) nullifies the main conclusion. If RC ratios were not used, it is not possible to state whether or not they have an effect on lending decisions. Thus, the sub-conclusion of the study should have been its basic one and that is RC ratios were not used in BLOs' decision making. The reasons why they were not used (as indeed was indicated by the researchers) are many (e.g., BLOs are not familiar with, or don't understand, RC data, or they may be already making their own adjustments for inflation effects, or may be it is a problem of information overload,³⁵ or perhaps all of these reasons combined). This

³⁵The concept of information overload is explained more fully in Chapter III, footnote 9.

however, does not prove that the RC data, if used, would not have any effects on lending decisions.³⁶

2. The classification of industries based on the capital intensity criterion may not necessarily lead to significant differences among the 4 industry groups used in the study in terms of the effect of RC disclosures on net income (a statistic affecting 4 out of the 5 ratios used). This is so since the differences in depreciation expense and cost of goods sold among the 4 industries used could also be due to other factors (beside capital intensity) such as depreciation method used, inventory costeflow assumption, and degree of dynamism in replacement of fixed assets. That is, two companies from the same industry could have significantly different depreciation expense and cost of goods sold due to the above-mentioned factors.

This research design problem does not arise in the present study since only one company is used and the only difference among the data sets received by the 7 different groups of BLOs is SFAS 33 information.

3. Diamond and Arnold used only financial ratios without the financial statements themselves. While ratios are an important element in BLOs' decision making, Casey (1980) found significant differences between predictions of failure by BLOs using only ratios and those by BLOs using the same ratios plus the balance sheet and the income statement. Furthermore, the use of only 5 ratios may have severely limited BLOs' basis for decisions. Casey (1980) used 8 ratios and still found differences as explained above.

³⁶ There is also a problem of research design related to this issue. Diamond and Arnold determined that BLOs did not use RC ratios by showing that there was no significant difference in the mean adjusted squared coefficient of multiple correlation, R^2 , between the control and treatment groups. They did not, however, compare the time used by the two groups. Had this been done, it might have shed some additional light on the issue of whether BLOs used RC ratios. That is, if the treatment group took significantly more time than the control group, this may have meant that BLOs did use RC ratios, however, this use did not affect their decisions. In the present study, the average time spent by each group will be compared to determine whether the treatment groups took significantly more time than the time taken by the control group.

In the present study, the entire set of financial statements (income statement, balance sheet, and statement of changes in financial position) is provided and no specific ratios are calculated.

4. The RC data used in calculating the 5 ratios were not the actual RC data reported by companies but were estimated by the researchers via adjusting HC data using specific price indices, and hence acquisition dates of property, plant, and equipment (PPE) had to also be estimated. These estimates may have not yielded accurate RC data. Even the HC data were obtained from the Compustat Industrial Tape with its inherent problem of possible inaccuracies.³⁷

In the present study, CD and CC data (as reported by the company) are used.

5. The loan request was for a 5-year period. This period may have been too long for BLOs to estimate the ability of the borrower to pay back the loan at its end. Most of the other research studies [e.g., Abdel-Khalik (1973), Libby (1975), Stephens (1978), and Casey (1980)] used a maximum of 3 years.

In this study, the maturity of the long term loan request is 3 years.

6. Limiting the amount of the loan to only 5% of the borrower's stockholders' equity may have made it too insignificant for BLOs to bother about the difference between RC and HC ratios.

In this study, the requested loan is about 15% of the company's stockholders' equity.

7. The sample was not randomly selected from the entire population of BLOs. Instead, it was chosen from 6 cooperating California banks. This may limit the generalization of the results.

In the present study, the sample is selected at random from the popu-

³⁷ There is at least one study [San Miguel (1977)] that showed that substantial differences exist between Research & Development data in Compustat tapes and 10-K reports. While this one study does not prove that other data in Compustat are inaccurate, the possibility is obviously there.

lation of BLOs in the entire United States.

8. The study used only one dependent variable--interest rate. Such rate is influenced by various general and economic factors beside financial statement information. A better design would have been to ask for the increment above the bank prime rate rather than for the entire interest rate. This would have been better for two reasons: First, the increment above prime and not the entire rate represents the difference in the degree of risk between one company and another, and Second, testing for the differences between the increment over prime may have yielded significant differences between groups. This is so because, in parametric tests, the difference between a mean interest rate of 17% or 17.5% and 18% may not be statistically significant while the difference between 0% or .5% and 1% may be statistically significant.

In this study, 7 dependent variables are used: 2 loan requests, 2 incrementals above prime rate, and 3 probabilities of default.

The studies reviewed in this Part relating to the effects of adjustments for changing prices on decisions indicate mixed results as summarized in Table II-5. About half the studies showed that GPLA or RC data have some effects on investments decisions. The other half showed no significant differences between investment decisions based on HC data and those based on GPLA or RC data alone or in conjunction with HC data. The only study examining the effect of RC data on lending decisions showed no statistically significant differences between decisions based on HC ratios and those based on HC plus RC ratios. However, that study was subject to several important limitations as shown above.

The mixed results shown by this literature review is an indication that the issue of the impact of CD and CC supplementary data on decisions has not been settled. Furthermore, the limitations to which most of the studies were

Table II-5

Summary of Studies Investigating the Effects of Adjustments for
Changing Prices on Decisions

Study	Focus	Conclusion(s)
Dyckman (1969)	The effects of GPLA data on financial analysts' decisions	GPLA financial statements (F/S) used alone or in conjunction with HC F/S can influence relative investment evaluations but not so strongly
McIntyre (1973)	The usefulness of RC data to investors in common stock**	Subjects receiving RC F/S did not perform any better than those receiving HC F/S. However, the majority of subjects receiving both HC and RC F/S indicated that RC F/S were useful in their analysis
Heintz (1973)	The effects of GPLA data on investment decisions**	With the exception of one period, subjects using GPLA or both GPLA and HC F/S did not make forecasts different from those made by subjects using only HC F/S
McEnroe and Nikolai (1979)	The usefulness of RC data vs. HC data in the evaluation of investor decision criteria**	There are no significant differences in the evaluation of the desirability of a firm as a function of either the <u>content</u> or the <u>form</u> of the accounting information received (HC only, RC only, or both)
Diamond and Arnold (1979)	The effects of 5 RC ratios vs. same HC ratios on bank loan pricing decisions (i.e., the interest rate charged)	- Differences between decisions made by BLOs receiving HC ratios and by those receiving both HC and RC ratios were not significant. - RC ratios did not have a different effect across industries. - There is no significant difference in consensus (variance) between groups. - RC ratios are substantially ignored by BLOs in making their decisions. - BLOs subjectively indicated that RC ratios had little effect on their decisions.
Stone (1980)	The effects of RC data vs. HC data on investment decisions**	There are no significant differences between decisions based on RC data and those based on HC data, either as to whether RC data were disclosed or as to the degree of capital intensity of the firm or industry

* Students were used as surrogates for real decision makers (i.e., investors).

KEY: HC: Historical Cost ; RC: Replacement Cost ; HOP: Historical Operating Profit ;
COP: Current Cost Operating Profit ; HG: Holding Gains & Losses ;
GPLA: General Price Level Adjusted ; BLOs: Bank Loan Officers.

subject indicate the need for additional studies that attempt to avoid most of these limitations. In view of the above, the present study is conducted.

In the following chapter, the decision making model of credit grantors (the subjects used in this study) is developed.

CHAPTER III THE DECISION MAKING MODEL OF CREDIT GRANTORS

One of the objectives of this research is to determine (theoretically as well as empirically) whether SFAS 33 disclosures are helpful to, used by, and affect the decisions of, bank loan officers (BLOs). In order to reach a decision, the decision maker needs information that is required by his decision model. Thus, to theoretically determine whether SFAS 33 disclosures should be of any help to BLOs, two steps must be taken: (1) determining (or at least outlining the framework of) the decision making model of BLOs and the information requirements of this model, and (2) determining whether SFAS 33 disclosures should theoretically be accommodated in that model.

Step (1) is covered in this chapter, while step (2) is discussed in the following chapter. The empirical determination of whether SFAS 33 disclosures are used by, and whether they affect the decisions of, BLOs is covered in Chapters V and VI.

This chapter is structured as follows: First, the decision making model of commercial lenders in general is discussed. Second, the credit analysis function of the model is analyzed in detail. Third, the input variables or factors involved in lending decisions are discussed. Fourth, the specific financial information requirements of BLOs are emphasized. Finally, a framework of the decision making model of BLOs is outlined.

The Decision Making Model of Commercial Lenders

In general, models are representations of real world phenomena as they exist or as they ought to exist. The former types are called "descriptive models" and the latter "normative models."

The distinction between the descriptive and normative models may not be clear-cut in every situation. A descriptive model cannot represent all

the existing lending phenomena, hence, there are likely to be some empirical observations which do not correspond to the model. On the other hand, a normative model can be a representation of some empirical phenomena, if the idea in the model has already been applied in practice.

The model of commercial lending decisions constructed in this study is a descriptive one representing the practices existing in a composite of commercial banks but not necessarily corresponding to the practices of any given bank.

Objectives of the Model

Lending is the essence of commercial banking. It is one of the major activities through which commercial banks generate their revenues. Mansfield [1979, p. 22] confirms this:

"Since more than 70% of most commercial banks' operating income comes from loan revenues, it can be correctly stated that the sound extension of credit is the most important function of a commercial bank."

Great care is exercised before making the final decision to grant any loan. Thus, as Cohen et al (1966) observe, any lending decision model usually has three different objectives:

1. Minimizing both default and liquidity risks to the bank.¹
2. Maximizing the bank's profit.
3. Maximizing the bank's services to its community.

Mechanical Modeling (2 Scoring)

With the expansion of banking in the last 10-15 years, the increasing use of computers for more than basic data processing, and the need for good analytical tools to supplement the efforts of lending personnel, efforts have been underway for some time to try to apply advanced statistical techniques to the loan evaluation process [See Exhibit III-8 for some of these

¹Default risk is the probability of losing the loaned funds and interest thereon. Liquidity risk is the probability that the bank loses its liquid status and becomes unable to pay demand deposits.

efforts]. These actions, particularly in regard to mechanical modeling (Z Scoring), have been useful in credit decision making in the consumer field and some were helpful in the prediction of business failure.

After some early disappointments, some mechanical models have been developed for commercial lending but they only fit specific types of loans and industries.²

Procedures of the Model

Lev [1974, p. 102] states that:

"Both the evaluation of the data and the final decisions are based mainly on the BLO's experience and intuition. No formal models, not even simplified ones, are known to be utilized by bankers in arriving at their lending decisions."

Lev's observation does not mean that BLOs lack procedural models, for lending decisions are being made and no decisions can be made without models, at least implicit ones. Revsine [1973, p. 5] supports this view:

"Whenever a decision is made, some decision rule or decision model is used in reaching that decision. The model may or may not be well suited to the problem faced. The model may be carefully formulated or may be applied on an ad hoc basis. It may or may not lead to the desired outcome. But as long as the decision maker selects a course of action, he is using some sort of model to reach that decision."

Nor does Lev's observation mean that any descriptive knowledge concerning bank lending decision processes is unavailable.³ First, Cohen et al (1966) show that BLOs make their lending decisions sequentially by comparisons with standards established by organizational policies which adjust for funds available for lending purposes. Second, Schoenborn (1976) observes that BLOs have expressed a desire for financial statements for use in making judgements concerning lending. Finally, Stephens (1978) argues that BLOs seem to understand what type of data they want to process for lending decisions.

²For an elaborate background and description of the state of the art of Z scoring commercial loans, see RMA [1978, pp. 20-26].

³Lev's observation may mean that BLOs do not explicitly rely on or utilize normative models such as, e.g., discriminant function models for credit ratings, etc., to any known extent.

In describing the procedures of the model, three functions are discussed: (a) the commercial lending decision process in general, (b) the specific lending procedures, and (c) the credit function. The first traces the flow of a loan through a bank, the second examines the actual processing of a loan from the initial application to disapproval or to loan review (for approved loans), and the third is a more detailed outline of the credit function in loan processing.

(a) The Commercial Lending Decision Process in General

The route followed by a commercial loan application as it proceeds through a bank differs from one bank to another. Vast differences in size, structure, organization, personnel, customers, and management philosophy (to cite but a few variables) are reflected in the loan processing system. On the other hand, as RMA (1978) observe, there are a number of basic functions which are performed in any bank, and there have been efforts (essentially quantitative in nature) to document these bank procedures for analyzing business loan applications. While such descriptions are interesting, it is difficult to generalize from them. Thus, the most useful discussion of lending procedures may be found in the work of those who developed simulation models for the loan decision process.⁴

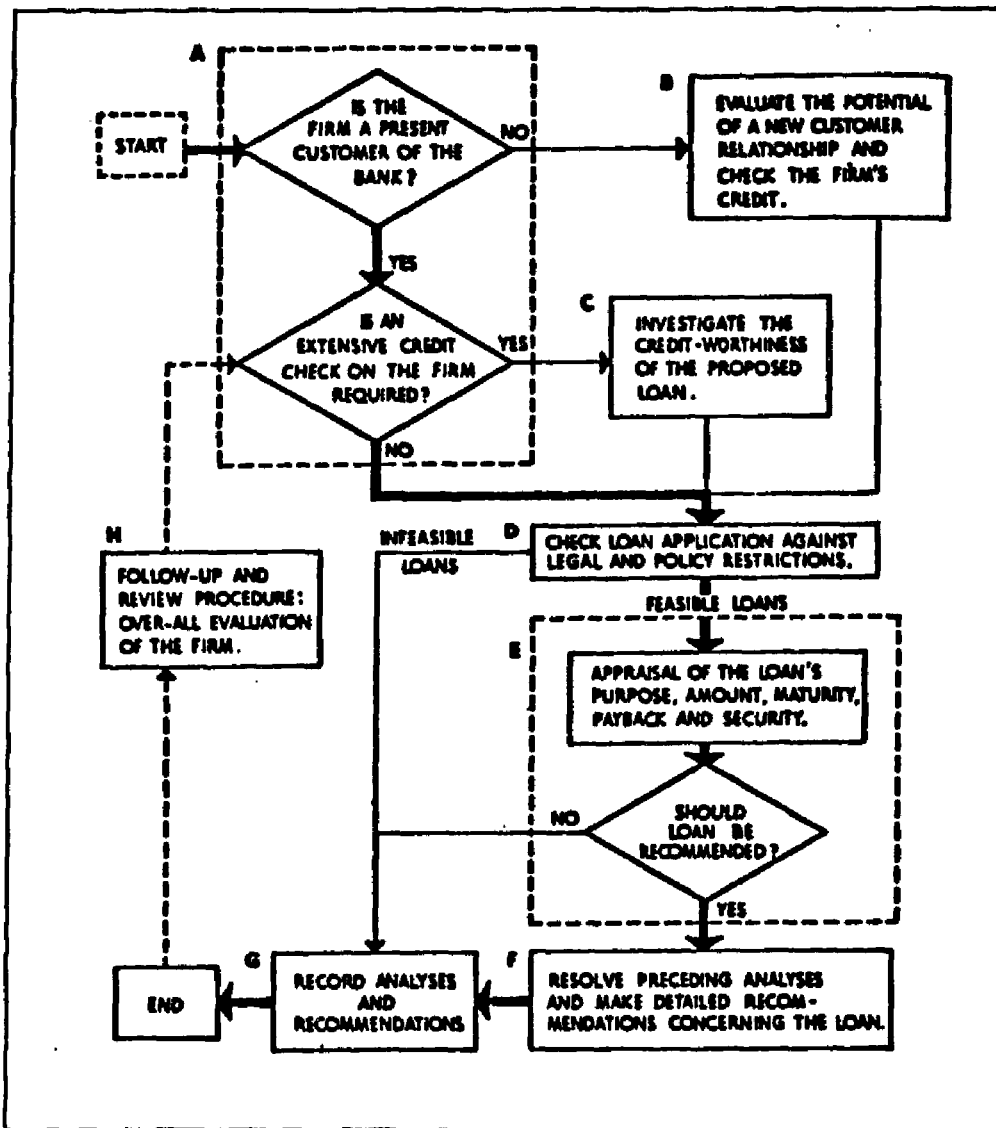
On the basis of intensive observations on two large commercial banks located in two major cities, Cohen et al (1966) developed a comprehensive model for the business loan decision process as shown in Exhibit III-1. As indicated, Cohen et al found there were eight main sections of bank procedures for analyzing business loan applications:

- A. Status of the firm's customer relationship.
- B. Evaluation of a new customer relationship.

⁴In recent years, there has been considerable effort to describe quantitatively how people use financial data. See, for example, Wright (1977) for a detailed bibliography.

Exhibit III-1

Bank Procedures for Analyzing Business Loan Applications



Source: Cohen et al [1966, p. 224]

- C. Credit evaluation.
- D. Check on legal and policy restrictions.
- E. Appraisal of the loan's purpose, amount, maturity, payback, and security.
- F. Detailed recommendations.
- G. Recording of analysis and recommendations.
- H. Follow-up and review.

A further discussion of these sections is presented in Exhibit D-2 in Appendix D.

Even though there may be some variations from one bank to another, the flowchart in Exhibit III-1 highlights most of the key elements in the commercial lending decision process.

(b) Illustrations of Specific Lending Procedures

Exhibit III-2 presents some specific procedures which may be followed by BLOs from the time they receive the loan application through its final disposition. Again, Exhibit III-2 is a composite of procedures followed by a number of banks which are not necessarily completely representative of procedures followed in any given bank. A further discussion of the various phases of Exhibit III-2 is presented in Exhibit D-3 in Appendix D.

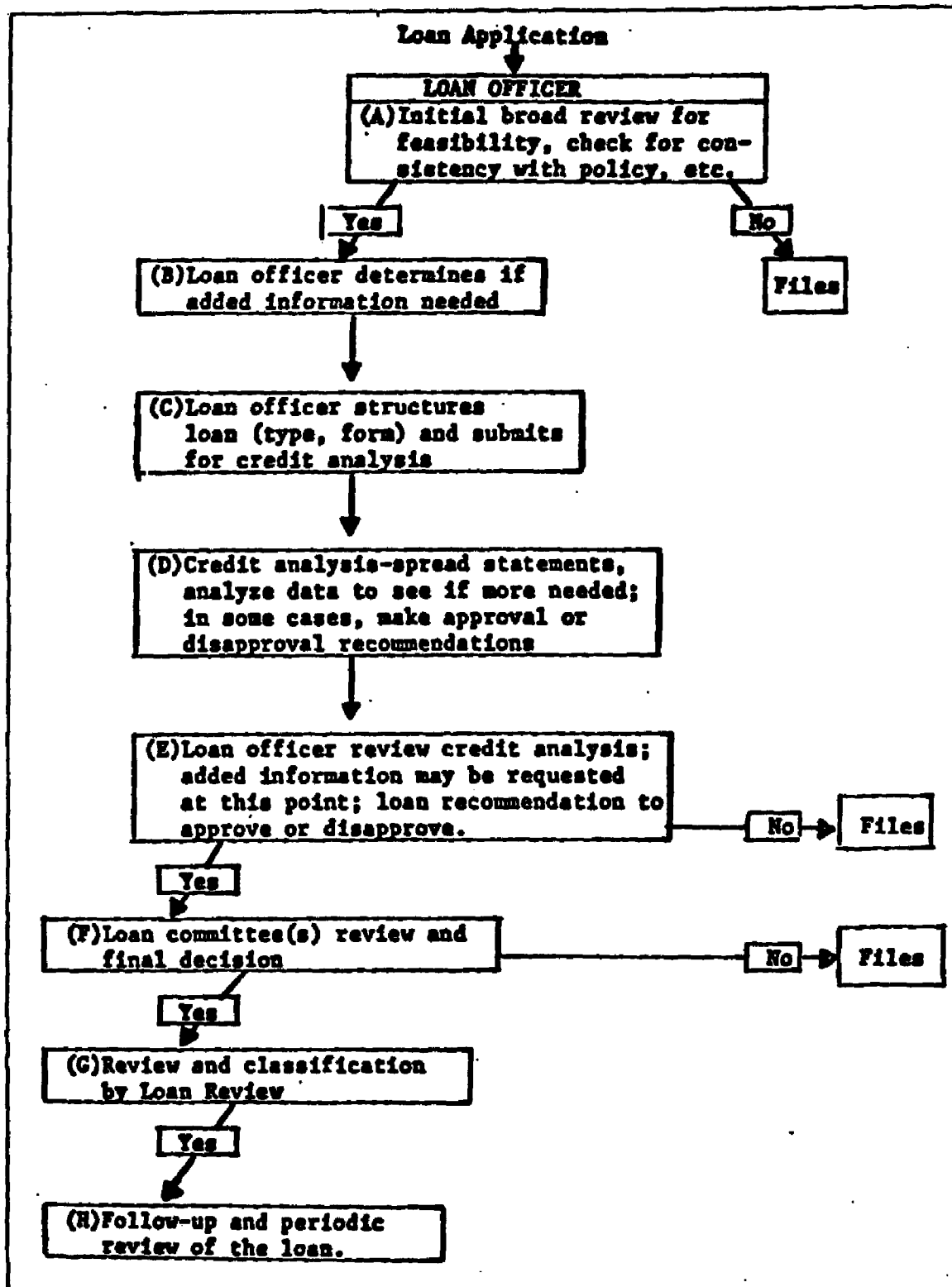
(c) The Credit Function

The credit analysis (Phase D of Exhibit III-2) needs further discussion because of its importance to this study. Exhibits III-3 and III-4 point out the great variety of activities which come under the credit function. A look at these exhibits reveals that there is much more to the credit function than spreading financial statements and computing financial ratios. Ultimately, it is a combination of a large number of factors (as illustrated in a later section of this chapter) which determines the credit decision. Still, financial data are the most important single factor in the credit decision process. Because of the importance of the analysis and evaluation of the credit worthiness of a firm, it is discussed further in more detail later on in this chapter.

In searching for a way of systematizing BLOs' use of financial data en route to lending decisions, Stephens (1978) examined the protocols⁵ of a group

⁵Collection of protocols is a research tool usually used in the field of psychology especially in regard to complex information processing situations. The decision maker is asked to verbalize his thoughts while he is making his decisions. These verbalizations are recorded (usually by a cassette recorder) and then analyzed by the researcher. For an elaborate description of this method as it is used in bank lending decisions, see Stephens (1978).

Exhibit III-2
COMMERCIAL BANK PROCEDURE CHART FOR
PROCESSING A COMMERCIAL LOAN



Source: RMA [1978, p.11].

Exhibit III-3

FREQUENTLY USED METHODS OF PERFORMING INTERNAL CHECKINGS, RESEARCH AND VERIFICATIONS (Many procedures apply to both requests for credit from new customers and requests for credit extensions from present or previous bank customers. Checkings would be made to ascertain both direct and indirect (contingent) liabilities).

1. CHECKINGS MADE WITHIN COMMERCIAL CREDIT DEPARTMENTACTIVE COMMERCIAL CREDIT
FILES AND RECORDS

Active files and records on currently borrowing customers and guarantors or customers who had relatively recent loan activity in the department.

INACTIVE COMMERCIAL CREDIT
FILES AND RECORDS

Includes credit files on paid out loans, prospect files or "declined" files.

2. CHECKINGS TO BE MADE INTERNALLY IF LOAN REQUEST IS FROM A BANK CUSTOMERCOMMERCIAL LOAN
SUPPORT SERVICES

Including: charge off & recoveries section; collection department; accounting; new business development.

COLLATERAL
RECORDS

To verify that previous loans were properly maintained, especially in regard to "margin" situations.

LOAN REVIEW
FUNCTION

Any loan reviews should be studied and findings should be discussed with the loan review officer and the loan officer.

DEPOSIT FUNCTION

Checking, savings & other time deposits are investigated, especially in regard to opening date, balances, and satisfactory handling of the account.

3. CHECKINGS TO BE MADE INTERNALLY FOR PRIOR, CURRENT AND NEW CUSTOMERSALL OTHER DEPARTMENTS
IN THE BANK

To ascertain the full extent of liabilities, other departmental records will be checked.

ANALYSIS AND RESEARCH FUNCTION

The internal analysis function may include: spreading financial statements, research regarding the company and the industry, financial analysis, credit analysis, and profitability analysis. This function will usually utilize many business publications in performing research such as Standard and Poors, The Wall Street Journal, and Moody's, in addition to the firm's own statements.

Source: NMA [1978, pp. 15-16].

of BLOs and an actual lending situation by one BLO. He attempted to identify components of a firm's operations for which information processing activities occurred where the output of such processes was used for decision making activities. Eight such activities were identified representing the management of cash, accounts receivable, inventory, accounts payable, working capital, and pricing, in addition to claims priority and equity cushion.

As Stephens noted, those 8 components are neither exhaustive nor inclusive. They merely represent a collective paradigm of information processing by a group of BLOs for seasonal business loans. Furthermore, the information processing activities (as represented by the 8 components) by BLOs en

Exhibit III-4FREQUENTLY USED METHODS OF CONFIRMING OR INVESTIGATING AN APPLICATION FOR A COMMERCIAL LOAN - EXTERNAL INFORMATION

<u>TRADE AND SUPPLIER CHECKINGS</u>	<u>AGENCY REPORTS</u>	<u>OTHER BANKS AND FINANCIAL INSTITUTIONS</u>	<u>PUBLIC RECORDS</u>	<u>SITE VISITS</u>
Checkings are normally made by the credit department. Inquiries made in writing or by telephone. This procedure helps confirm or provide information about extensions of credit from the trade.	Reports are ordered from various agencies, with the source of the report varying with the type of credit extended. Frequently used agencies are Dun & Bradstreet, TRW, NACIS, Bishop, and local credit bureaus. Certain agency reports would also cover trade checkings.	Following the guidelines for the exchange of commercial credit information, credit departments customarily telephone other banks. These banks are usually given as a reference by the potential customer. In some cases, only confirmation of the information provided by the customer is requested. Savings and loan associations, finance companies, and other organizations that extend credit may be contacted.	Credit departments frequently use the services of various "search" bureaus to check the public records. For example, it would be common practice to order a search on a business property showing financing statements, mortgages, and judgments. Title searches are also ordered by this function.	The site visit may be done by the loan officer or other department of the bank. In some cases, the credit department is responsible for this function.
NOTE: The order in which these functions are performed by the credit department will vary with the staff size. Priority determination will usually depend upon the type of credit requested and the collateral involved. In a fairly large credit department, these checkings might be initiated simultaneously by different individuals.				

Source: RMA [1978,p.17].

route to their decisions follow a sequential pattern as illustrated in Exhibit D-4 in Appendix D. This Exhibit allows for processing and recording of information, the attention directing function of accounting information, and the ability to adjust financial statement information based on available or requested data.

The Credit Analysis Function of the Model: An Elaboration

As indicated earlier under the objectives of the decision making model of commercial lenders, lending institutions normally try to strike a balance between risk and return, community service, and a long list of other considerations which enter into making a specific credit decision. Thus, while the financial statements and their analysis are crucial to the credit decision, the many other factors which are at least considered in making a loan decision should not be overlooked. Exhibit III-5 presents a number of these other factors relating to management, control, and markets which affect the risk in extending credit. In practice, of course, not all of these factors enter into any given situation, and some situations may require other factors

FACTORS AFFECTING RISK
(Financial Statement Items Excluded)

MANAGEMENT

- Professionalism
- Character and integrity
- Depth, overall and by major area
- Age
- Experience in the industry
- Commitment to planning and controls
- Reasonable long-term objectives
- Full-time at this firm
- Degree of cooperation and communication with each other and with the bank
- Continuity (i.e., successor management)
- Ownership interest
- Use of strong outside advisors
- Other business associations or ties
- Composition of the Board of Directors

CONTROL

- Frequency of statement preparation
- Quality of statements, source and audits
- Loan agreement(s), tight or loose provisions
- Collateral quality
- Collateral value defined by appraisal
- Collateral margin sufficient
- Timeliness and accuracy of reports and agings of accounts receivable and/or payable
- Frequency of accounts financing audits
- Frequency of review of the loan by the bank
- Loan/Collateral relationship policed well
- Audited year-end statements and bank's knowledge of the auditors
- Whether the credit is secured or unsecured
- The currency of personal statements if the credit is guaranteed
- Degree of protection with personal guaranty (good faith)
- Documentation in order initially and throughout the life of the loan
- The purpose of the loan when it is extended

MARKETS

- The industry outlook, including the possible impact of energy and environmental considerations
- The size of the market
- The elasticity of demand and supply
- Pricing policies
- Raw material availability
- The manpower situation
- Union contracts
- Government controls
- Competition
- Diversification

which are not included in this list. Nevertheless, the list does illustrate the variety of factors, beside financial statement items, which a BLO may weigh in evaluating the credit risk in an existing or potential borrowing arrangement. However, as stated earlier, the analysis of the borrower's financial statements is the single most important element in the final decision of credit extension. This section discusses in detail this analysis and credit evaluation.

Short-term and seasonal commercial loans are usually supported by the tangible assets (balance sheet) approach of evaluating credit worthiness. Long-term loans are usually supported by the intangible asset (income statement) approach implicit in the firm's net income stream.

Cohen et al (1966), in their attempt to develop a computer model to simulate lending decision models by BLOs, state that there are 5 main segments to the bank credit evaluation model:

- A. Is the bank's share of risk clearly unreasonable?
- B. Does the firm has enough current assets?
- C. Are the firm's current assets sufficiently liquid?
- D. Is the firm sufficiently profitable?
- E. What is the final credit rating of the firm?

Exhibit D-5 in Appendix D presents a further discussion of the above 5 segments to give some insights into the credit evaluation process.

Input Variables or Factors Involved in Lending Decisions

As indicated earlier, a lending institution tries to strike a balance between risk and return, community service, and a long list of other considerations which enter into making a specific credit decision. [Robert Morris Associates (RMA), 1978, p. 18]. This section discusses the factors

which are usually considered in making a credit decision.

There is no generally agreed upon set of variables or factors that enter into lending decisions. A Vice President at Citibank, Mansfield [1979, p. 23] confirms this view:

"It is important to recognize that credit decisions cannot be based entirely on any set of guidelines or analytic techniques. The loan officer must always exercise common sense and good judgment and be scrupulously provident."

Rather, each writer or bank officer stresses certain variables as shown in Exhibit III-6.

From a review of the literature and personal interviews with bank officers it seems that BLOs, in considering the above factors, tend quite frequently toward a conservative and cautious behavior. That is, they tend to make sure that as many factors as possible are considered before making the final loan decision. This behavior may be due to the notion that people are usually more risk averse when handling other people's money than when handling their own. This may be supported by the fact that the primary source of loanable funds in banks is customers' deposits and not owners' equity⁶, which make BLOs more risk averse than other types of investors.

A look at Exhibit III-6 reveals that there is an endless list of variables influencing the loan decision. However, these variables may be classified into the following five categories which may be viewed as building blocks:

A. Factors Relating to the Borrower:

The factors relating to the borrower may be further subdivided into two subcategories: (1) factors relating to the borrower's business, and (2) factors relating to the borrower's management.

⁶As of March 31, 1981, all commercial banks in the U.S. had \$120.0 billion of capital accounts and \$1,381.1 billion of liability accounts (including \$1,136.7 billion of deposits). On the assets side, loans totaled \$840.8 billion of total commercial banks assets of \$1,256.7 billion. [Federal Reserve Bulletin, April, 1981].

Exhibit III-6

Input Factors Considered in Lending Decisions

Input Factors Considered in Lending Decisions Author and Year →	Cohen, et al (1966)	Heister (1966)	Hodgman (1968)	Hayes (1971)	Kulava (1971)	Cooper (1975)	Crigger (1975)	McCartough (1975)	RMA (1978)	Hansfield (1979)	Helmsmeyer (1980)	Total out of 11
1. The share of the bank in the risk	X	X	X	X	X	X	X	X	X	X	X	1
2. Sufficiency of current assets	X	X	X	X	X	X	X	X	X	X	X	1
3. Degree of liquidity of current assets	X	X	X	X	X	X	X	X	X	X	X	2
4. Profitability	X	X	X	X	X	X	X	X	X	X	X	1
5. Deposit balances at the lending institution	X	X	X	X	X	X	X	X	X	X	X	2
6. Current ratio	X	X	X	X	X	X	X	X	X	X	X	1
7. Length of time (or history of) borrower as a depositor	X	X	X	X	X	X	X	X	X	X	X	2
8. Profits	X	X	X	X	X	X	X	X	X	X	X	1
9. Business location	X	X	X	X	X	X	X	X	X	X	X	1
10. Magnitude of total assets	X	X	X	X	X	X	X	X	X	X	X	1
11. Ability to pay	X	X	X	X	X	X	X	X	X	X	X	2
12. Willingness to honor the terms of the contract	X	X	X	X	X	X	X	X	X	X	X	1
13. Length of maturity	X	X	X	X	X	X	X	X	X	X	X	2
14. Prospects of long-term banking relationship	X	X	X	X	X	X	X	X	X	X	X	2
15. Interest rate charged	X	X	X	X	X	X	X	X	X	X	X	2
16. Short-term & immediate deposit relationship	X	X	X	X	X	X	X	X	X	X	X	1
17. Purpose of the loan	X	X	X	X	X	X	X	X	X	X	X	3
18. Payout schedule	X	X	X	X	X	X	X	X	X	X	X	1
19. Management's experience (past & present)	X	X	X	X	X	X	X	X	X	X	X	1
20. " reputation	X	X	X	X	X	X	X	X	X	X	X	1
21. " character	X	X	X	X	X	X	X	X	X	X	X	3
22. " personality	X	X	X	X	X	X	X	X	X	X	X	1
23. " influence	X	X	X	X	X	X	X	X	X	X	X	1
24. Loan's collateral	X	X	X	X	X	X	X	X	X	X	X	3
25. Economic conditions	X	X	X	X	X	X	X	X	X	X	X	2
26. People	X	X	X	X	X	X	X	X	X	X	X	1
27. Protection	X	X	X	X	X	X	X	X	X	X	X	1
28. Payment	X	X	X	X	X	X	X	X	X	X	X	1
29. Capacity	X	X	X	X	X	X	X	X	X	X	X	1
30. Capital	X	X	X	X	X	X	X	X	X	X	X	1
31. Contingencies	X	X	X	X	X	X	X	X	X	X	X	1
32. Conditions	X	X	X	X	X	X	X	X	X	X	X	1
33. Competition	X	X	X	X	X	X	X	X	X	X	X	1
34. Circumstances	X	X	X	X	X	X	X	X	X	X	X	1
35. Civic responsibilities	X	X	X	X	X	X	X	X	X	X	X	1
36. Continuity	X	X	X	X	X	X	X	X	X	X	X	1
37. Control	X	X	X	X	X	X	X	X	X	X	X	1
38. Overall objectives and responsibilities of the bank	X	X	X	X	X	X	X	X	X	X	X	1
39. mandates of the regulatory authorities	X	X	X	X	X	X	X	X	X	X	X	1
40. planning of the funds flow	X	X	X	X	X	X	X	X	X	X	X	1
41. Identification of both the primary and secondary sources of repayment	X	X	X	X	X	X	X	X	X	X	X	1
42. Sales and earnings trends	X	X	X	X	X	X	X	X	X	X	X	2
43. Historical (past) cash flow trend	X	X	X	X	X	X	X	X	X	X	X	2
44. Overall financial strength	X	X	X	X	X	X	X	X	X	X	X	1
45. Managerial ability	X	X	X	X	X	X	X	X	X	X	X	1
46. Historical financial policies	X	X	X	X	X	X	X	X	X	X	X	1
47. Balance sheet	X	X	X	X	X	X	X	X	X	X	X	1
48. Asset mix and leverage	X	X	X	X	X	X	X	X	X	X	X	1
49. Impact of the loan request on sales, profits, and cash flow	X	X	X	X	X	X	X	X	X	X	X	1
50. Type of credit under consideration	X	X	X	X	X	X	X	X	X	X	X	1
51. Amount of loan	X	X	X	X	X	X	X	X	X	X	X	1
52. Knowledge of management	X	X	X	X	X	X	X	X	X	X	X	2
53. Industry conditions	X	X	X	X	X	X	X	X	X	X	X	1
TOTALS*	4	6	8	21	0	4	1	4	4	8	8	69

* It should be noted that of the total 53 factors considered in lending decisions by the authors surveyed in this Exhibit no single factor was mentioned by more than 3 out of 11 authors.

A-1. Factors Relating to the Borrower's Business:

The factors relating to the borrower's business include: sales and earnings trends, history of cash flow, liquidity, current assets, total assets, asset mix, leverage, capital, profits, profitability, long-term solvency, business location, competition, and overall financial strength.

A-2. Factors Relating to the Borrower's Management:

The factors relating to the borrower's management include: management's ability, professionalism, character, integrity, track record, experience, reputation, personality, influence, and civic responsibilities.

B. Factors Relating to the Loan:

The factors relating to the loan include: loan's type, amount, purpose, maturity, collateral, interest rate, payout schedule, and sources of repayment.

C. Factors Relating to the Bank:

The factors relating to the bank include: the bank's overall objectives and responsibilities, mandates of the bank regulatory authorities, bank's share in the risk, and the bank's legal and policy restrictions.

D. Factors Relating to the Relationship Between the Borrower and the Bank:

These factors include: history of the borrower's relationship with the bank, short-term and immediate deposit relationship, and prospects of a long-term banking relationship.

E. General Factors:

The general factors include: general economic and industry conditions.

A review of the literature [e.g., Hodgman (1968), Abdel-Khalik (1973), and Mueller (1976)] seems to suggest that the factors in A-1 above relating to the borrower's business are the most important in the final loan decision. Most of these factors can be determined by an evaluation of the borrower's financial statements. This is why the role of accounting information in

lending decisions is prominent. The above literature also seems to treat all other factors [A-2 through E] as supporting factors and, thus, they would not be influential by themselves in whether or not a loan should be granted.

Specific Financial Information Requirements of Bank Loan Officers

RMA [1964 and 1978] hold the view that financial accounting data represent a major factor in all business loans and are crucial in the evaluation of the loan application. The importance of financial statement information stems from the notion that financial statements are supposedly prepared in accordance with a logically consistent set of rules and procedures confirmed by business experience (and probably training) over a long period of time. As such, they provide a reasonable and well understood portrayal of important points of information concerning an entity requesting a loan. Furthermore, this requirement is easily communicated to prospective borrowers.

The specific financial information that BLOs require for making their loan decisions include information about liquidity (as measured by current ratio, acid-test ratio, etc.), profitability and its trend (as measured by net income, return on investment, etc.), long-term solvency (as measured by debt/equity ratio, coverage ratios, etc.), and size of the firm (as measured by total resources or total sales).

Even though BLOs put great emphasis on cash flow as the primary factor in determining the final loan decision, there seems to be some evidence of an increasing importance of other factors in evaluating the riskiness of a borrower. For example, in a survey of demand for bank loans by small firms, Johnson (1966) reports that the most frequent reasons for refusal of granting loans were: (1) a high debt/equity ratio, (2) a poor earnings record, (3) a questionable management ability, (4) a collateral of insufficient quality,

and (5) the inadequacy of the borrower's accounting system. While cash flow may be affected by some of the above factors, 'poor cash flow record' was not specifically listed as a frequent reason for declining a loan request.

In a more recent article, Mansfield [1979, p. 25] confirms the increased importance of balance sheet analysis:

"Despite this extensive cash flow orientation [of bank lending decisions], it has become clear in recent years that the balance sheet or financial position of borrowers is at least as important as the income statement or operating performance. Liquidity, as well as the overall quality of a borrower's assets and liabilities, has taken on renewed and increased importance. Moreover, it has been said that the return on total assets will probably replace EPS as a more meaningful, if not more popular, measure of overall managerial performance."

In a study of the use of financial information by BLOs, Stephens (1978) found that BLOs make an initial determination of an "information adequacy" [operationalized as "properly prepared financial statements"] for their decision processes. Lack of information adequacy would delay a decision or result in peremptory declination of a loan request.

Other specific financial information required by BLOs are discussed in the following sections which analyze the ranking of information importance and the use of ranked information by BLOs.

Ranking of Information Importance by Bank Loan Officers

Stephens (1978) used an information set to obtain ratings (on a 5-point scale from very unimportant to very important) of information importance from 29 BLOs. The chosen information set included 58 items covering 6 main categories.⁷ The frame of reference against which BLOs were asked to rate the importance of information items was that of deciding on a company's loan request for an unsecured commercial loan in excess of \$50,000.

⁷These categories are: (1) balance sheet items; (2) income and retained earnings statements items; (3) other statements; (4) ratios, statistics and details of information; (5) accounting method; and (6) projections and budgetary disclosures. This information set was previously utilized by Chandra (1974) to compare information importance rating by accountants and security analysts.

Of the 58 information items, 12 were rated 'Very Important', 29 'Important', and 17 'Neither Important Nor Unimportant.' [See Exhibit III-7]. No items were rated 'Unimportant' or 'Very Unimportant.' Because BLOs rated different items differently, Stephens suggests that BLOs have definite structure to their ratings of information importance with respect to information used in their decision processes. However, he argues that the fact that no items were rated unimportant or very unimportant indicates an inability on the part of BLOs to rate an information item which is presently included in the financial statements as unimportant. He adds that such a finding is consistent with both the "functional fixation" hypothesis [as defined by Ijiri et al, 1966]⁸ and human information processing concepts of "information overload" in the face of environmental complexity [as discussed by Schroder et al (1967), Revsine (1970) and Casey (1980)].⁹ It is surprising, however, that Stephens contradicts himself, in another part of his dissertation, by concluding that BLOs participating in his study were not affected by information overload. It is also possible that BLOs are 'reluctant' rather than 'unable' to rate an

⁸By "functional fixation," Ijiri et al (1966) mean the inability of a decision maker to adjust his decision making function (or the accounting numbers) to take into account the differences in the accounting system outputs which are due to different accounting procedures (or methods) in the measurement communication process. [e.g., if one company is using FIFO and another is using LIFO, the decision maker may not be able to adjust the income number of one company to make it comparable to that of the other company before making his decision]. As noted by Ashton (1976), this definition is different from "functional fixation" as utilized in psychology which refers to functions of objects and an inability to utilize objects for different functions in new contexts.

⁹Schroder et al [1967, p. 31] define an environment as complex if it provides "excessively diverse and/or numerous dimensional units of information." That is, information which requires substantial integration of thought can be described as multi-dimensional and therefore complex. Schroder et al's model relates levels of information load to information processing complexity. Information processing complexity is the composite degree of differentiation, discrimination, and integration applied to an information load. Differentiation is the perception of elementary dimensions or aspects of information stimuli; discrimination is the detection of differences among stimuli dimensions; and integration is the combination of stimulation dimensions. Revsine [1970, p. 705] considers the financial reporting environment to be complex (since the financial decision maker must consider many

Importance Rating of Financial Information by Bank Loan Officers
[As Per Stephens (1978) Study]

A. Information Items Rated 'Very Important':

1. Total assets.
2. Total current assets.
3. Total current liabilities.
4. Amount of inventory and the method used in its valuation.
- (a) 5. Total shareholders' equity and number of common shares outstanding.
6. Total revenue and revenue recognition method.
7. Operating income before nonrecurring gains and losses.
8. Amount and breakdown of operating expenses.
9. Cost of goods sold.
10. Sources and applications of funds statement.
11. Extent of dependence on few customers.
- (a) 12. Cash flow projections for next 2 to 5 years.

B. Information Items Rated 'Important':

1. Market value of marketable securities.
- (d) 2. Breakdown of inventory.
3. Fifo cost of inventory.
4. Market value of inventory.
5. Amount of past pension fund liability, if material.
6. Goodwill recognized in each acquisition during the year.
7. Deferred income tax liability or prepaid income tax.
8. Investment in each subsidiary company.
9. Capital expenditures for period.
- (b) 10. Amount and breakdown of preferred stock and long-term debt by type, dividend and interest rate, and maturity.
- (b) 11. Amount and method of depreciation expense.
12. Straight line depreciation amount.
13. Accelerated depreciation amount.
14. Amount of nonrecurring gains and losses.
15. Income tax expense.
16. Each subsidiary's earnings and parent's share in each.
17. Rent payments or receipts on long-term leases.
- (d) 18. Terms, annual rentals, and breakdown of long-term leases by type of property leased (e.g., real estate, equipment, etc.).
19. Backlog and projection of orders.
- (e) 20. Productive capacity and actual output.
21. Share of market in major product areas.
- (c) 22. Number of shares owned by company officers.
23. Contractual restrictions on common dividend, if any.
24. Names of top executives, lines of authority, and remuneration.
25. Accounting method for research, development, and exploration.
26. Accounting method for each acquisition during period.
27. Accounting method for reporting long-term leases.
28. Planned capital expenditures for the next 12 months.
29. Planned expenditures on research, development and exploration for next 12 months.

C. Information Items Rated 'Neither Important' Nor 'Unimportant':

1. Minority interest in each consolidated subsidiary.
2. Number of stock warrants and convertible securities outstanding.
3. Amount expended on human resources (hiring, training, etc.), if material.
- (a) 4. Research, development, and exploration expenditures for period.
5. Advertising and publicity expenses for period.
- (a) 6. Amortization of goodwill and other intangibles, if material.
7. Price level adjusted annual reports as supplementary statements.
8. Earnings per share and method of its computation.
9. Compound rate of growth in EPS for the last 5-10 years.
- (a) 10. Dividends per common share.
- (a) 11. Breakdown of sales, net income, and investment by geographical area (using a 15% test).
- (a) 12. Breakdown of sales, net operating income, and investment by product line and customer group (using a 15% test).
13. Number and type of common shareholders.
14. Terms of stock option plans and shares involved.
15. Accounting method for advertising and publicity costs.
16. Planned expenditures on advertising and publicity for next 12 months.
- (a) 17. Cost of marketable securities.

- (a) Rated 'Important' in San Miguel and Stephens (1976) (S&S) and the equivalent of 'Important' in Falk et al (1976), both studies are discussed later.
- (b) Rated 'Very Important' in S&S and the equivalent of 'Very Important' in Falk et al.
- (c) Rated only 'Neither Important Nor Unimportant' in S&S.
- (d) Rated the equivalent of 'Very Important' in Falk et al.
- (e) Rated the equivalent of 'Neither Important Nor Unimportant' in Falk et al.

information item as unimportant because of the notion that more information [especially free information since BLOs do not pay a cost for their ratings] is usually preferred to less.

A look at Exhibit III-7 reveals some interesting observations pertinent to the present study:

(1) Even though BLOs rate Price Level Adjusted (PLA) annual reports as supplementary statements as neither important nor unimportant, they rate market value of marketable securities and market value of inventory as important to their lending decisions. Would this mean that BLOs consider CC disclosures as important while CD disclosures as neither important nor unimportant? This is one of the questions to be indirectly subject to empirical testing by the present study. If CC data affect BLOs' decisions while CD data do not, it may be concluded that it seems as though BLOs consider CC data to be important to their decisions while CD data are not considered so.

(2) BLOs rate capital expenditures for the period, planned capital expenditures for the next 12 months, and planned expenditures for research, development and exploration for the next 12 months as important for their lending decisions. The CC of replacing existing assets may be considered a dimension of a single bit of information. Casey [1980, p. 37] defines information overload as a decline in user performance due to the assimilation of additional information. [Other studies including Miller (1956), Oskamp (1965), Schroder et al (1967), and Driver and Mock (1975) consider overload as nonimproving user performance due to the processing of additional information. It is noted that Casey (1980) tests provided evidence of this latter definition rather than the one he presented above]. Casey's definition relies on Schroder et al's model which predicts that subjects will respond to increases in information overload by increasing the complexity of their information processing conceptual structure from relatively low-level "concrete" to high-level "abstract." More stimuli are detected, finer distinctions are drawn among them, and the stimuli are integrated in an increasing number of alternative ways. This process continues as more data are processed until the cognitive structure becomes over taxed by the sheer number of stimuli which it must combine. At this point, resources formerly committed to the perception of stimuli are deployed to their integration so that new stimuli are less well perceived. This effect is what is known as information overload.

surrogate for planned capital expenditures. Does it follow that CC data are important in lending decisions? Again, the present study addresses this question empirically even though indirectly as explained under (1) above.

(3) It is very surprising that BLOs rate the amount expended during the period on human resources (hiring, training, etc.), on research, development and exploration, and on advertising and publicity as neither important nor unimportant for lending decisions. These items are, by their nature, "manageable" or "discretionary" expenses and could be very important (especially if their trend as a percentage of sales is analyzed) in judging the character of management and its financial policies, the quality of earnings, and, in fact, cash flow from operations, all of which are factors universally agreed upon by BLOs as very important in lending decisions. However, in another study, San Miguel and Stephens (1976), BLOs rated research, development and exploration expenses for the period as 'important.'

The results of Stephens (1978) study also indicate that BLOs give high rating to information items which are utilized in the computation of financial ratios (e.g., total current assets, total current liabilities, etc.). This might provide added support to studies which have utilized financial ratios. [These studies are summarized later on in this chapter]. However, it should be noted that all of these studies were made before the effective date of SFAS 33. Most of these ratios would be affected by the disclosures under SFAS 33 as illustrated in Chapter IV.

It is also observed that when Stephens changed the general decision context to allow for changes in the rate of inflation, 37 of the 58 information items were listed by one or more respondents as items which their ratings of importance would change. In general, for rates of inflation less

than 10%, few respondents wanted inflation adjusted financial statements. As inflation rate reaches 10% or more, many respondents requested adjustments for many of information items importance ratings. Respondents were also asked what type of inflation adjustments would they prefer and they were split roughly equally among specific price level adjustments, replacement costs, and general price level adjustments. This issue will also be addressed empirically in the present study.

San Miguel and Stephens (1976) [S&S] surveyed a randomly selected sample of 200 BLOs who were RMA members at the largest 100 banks. The subjects were asked to rate the importance of the same information set of Stephens (1978) using the same rating scale. The results were similar to those of Stephens with the exceptions shown on Exhibit III-7 .

Falk et al (1976) made a similar study of the rating of information importance by BLOs but used a smaller information set (43 items) than that used in the aforementioned 2 studies, and focused on the required disclosures by closely held corporations. Especially important to the present study is the first question they addressed, namely: which financial statement information did BLOs consider the most important? The differences in rating of certain information items between Stephens and Falk et al are reported on Exhibit III-7. However, Falk et al information set included 18 items not included in Stephens study.

Following are some observations on Falk et al's findings which are pertinent to the present study:

(1) The current market value for marketable securities is ranked 13 out of 43 while the effects of price level changes and adjustments are ranked 39 out of 43. The fact that the market value of marketable securities is ranked important and the effects of price level changes are ranked unimportant may be an indication that CC disclosures are more important to

BLOs than CD disclosures. As discussed earlier, this notion is addressed empirically in the present study even though indirectly.

(2) Again, as in Stephens study, no information items were given 0 (i.e., should not appear in the financial statements) by BLOs. This may indicate the inability or the reluctance of BLOs to rate an information item presently on the financial statements as unimportant. That is, it could be due to the functional fixation hypothesis or the information overload concept (discussed earlier), or it may simply mean that BLOs would rather have an information item (even though they may not use it in decision making) than not having it. However, these competing hypotheses are not empirically tested in the present study.

(3) The statement of changes in financial position is accorded high importance rating (4 out of 43) and this is expected since this statement may reveal information about the financial behavior and character of management, which is an important factor in lending decisions.

(4) Stephens study showed that the type of accounting method used is rated important, whereas Falk et al study showed that the 'change in accounting method' is rated very important (the highest ranking). This is also expected since BLOs are interested in trend analysis provided the same accounting methods were used over the trend analysis period. Thus, a change in accounting method is accorded more importance than merely knowing the accounting method being used in any one particular period.

(5) Balance sheet items were rated very important in both Stephens and Falk et al studies whereas income statements items were rated very important in Stephens' and only important in Falk et al's study. This may be due to the fact that in Falk et al study the companies were closely held where loans are usually secured and thus more emphasis is placed on

collateral (and balance sheet) evaluation.

(6) Future projections were accorded lower importance in Falk et al study. [Budgeted capital expenditures were rated 22 out of 43 and discussion of major factors influencing next year's results including the firm's industry and economy was rated 32 out of 43]. This may indicate that there is no general agreement about the importance of these 'soft' information to lending decisions. (Of course, it may also mean that the degree of BLOs' confidence in closely held companies' projections is less than that in publicly held companies').

Benjamin and Stanga (1977) conducted another study of importance ratings (of 79 information items) by both BLOs and financial analysts. Again, as in the studies reviewed in detail above, price level adjustments were rated unimportant by both groups. BLOs ranked price level adjustments 71st, and analysts ranked them 72nd.

Stanga (1979) examined the reliability (as perceived by BLOs) of the CC versus HC measurements of five accounts: inventory, PPE, accumulated depreciation, cost of goods sold, and depreciation expense. As would be expected, Stanga found that HC was perceived as considerably more reliable than the associated CC measure.

Oliver (1974) examined the usefulness of financial reports to commercial lenders. He conducted case studies to "ascertain what possible effects, if any, might be introduced into bankers' loan decision making by a major shift in published financial reports." Oliver's findings generally confirm the existence of some set of very broad rules or guidelines which BLOs seem to employ in reaching their credit decisions and emphasize the fact that financial statements play an important role in this decision making process. Oliver also reported that, while most bankers are satisfied with present financial statements, "there is a large minority willing to

accept the introduction of meaningful and useful changes."

Noting that Oliver's study is relatively old and that many changes in financial reporting occurred since 1974, it is of interest to find out if that 1974 large minority of BLOs who were willing to accept the introduction of meaningful and useful changes is now a majority. Provided that the meaningfulness and usefulness of SFAS 33 data are theoretically established, the present study will attempt to shed some light on this question.¹⁰

The themes discussed in the previous studies are integrated in the framework of BLOs' decision making model at the end of this chapter. First, an analysis of the use of information preferred by BLOs is presented below.

Use of the Information Preferred by Bank Loan Officers

(a) Delaying or Declining Credit Decisions

Stephens (1978) observed that most of the BLOs participating in his project would delay their credit decisions until receipt of information items rated very important or important. Only part of this delay would, however, result in a terminal decision. Half of the participants would decline the credit request without contacting the credit requestor if most of the information items rated very important were not received in the financial data supplied by him. Due to the nature of the information items rated very important, failure to receive them would mean failure to receive financial reports. This, in turn, suggests that there is a 50% probability that a lack of financial statements (in proper form) would cause an unsecured loan request of an amount greater than \$50,000 to be declined.

(b) Use of the Information Items Rated Very Important

As expected, Stephens (1978) found that 11 of the 12 information items

¹⁰That is, if it is found that SFAS 33 data affect BLOs' decisions in the direction expected theoretically (i.e., a company disclosing SFAS 33 data that show a negative impact on its net income receives more unfavorable decisions than if it did not disclose these data), this may be an indication that BLOs seem as though they consider SFAS 33 data as meaningful and useful to them in making their decisions.

rated very important were extensively used by BLOs en route to their decisions.¹¹ Table III-1 shows those 11 items and the number of BLOs using each item out of a total of 9 BLOs.

Table III-1
Use of Information Items Rated Very Important

Information Item	No. of BLOs (out of 9) Using it	% of Total of 9 BLOs
1. Inventory and its valuation method	9	100.0%
2. Total Revenue	9	100.0
3. Operating Income	9	100.0
4. Current Assets	8	88.9
5. Current Liabilities	8	88.9
6. Total Equity	8	88.9
7. Cost of Goods Sold	8	88.9
8. Operating Expenses	7	77.8
9. Sources and Uses of Funds Statement	6	66.7
10. Total Assets	3	33.3
11. Dependence on few customers	2	22.2
Mean Usage	6.8	75.6
Median	8	88.9

Additional information items used extensively even though they were not included in Stephens's information set were: Accounts Receivable, Accounts Payable, and Total Liabilities. As RMA (1978) observe, these 3 items have an important role in financial ratio analysis and credit evaluation by BLOs.

How These Information Items Were Used:

The information items rated very important were used:

1. to compute financial ratios;
2. in terms of the amount (magnitude) of the item itself;
3. in making a trend of financial ratios (i.e., year-to-year pattern); and
4. in a cross-sectional type of comparison with a standard whether the standard is industry related or not.

¹¹The 12th information item rated very important, "Cash flow projections for the next 2 to 5 years", was not reported by Stephens probably because it was not used extensively by BLOs in the process of reaching their decisions.

(c) Use of Information Items Rated Important

Only 6 of the 29 items rated important in Stephens study were used by 2 or more BLOs. These 6 items were:

1. Amount of deferred taxes.
2. Amount and breakdown of preferred stock and long-term debt.¹²
3. Amount of depreciation expense.
4. Rent payments or receipts on long-term leases.
5. Number of company shares owned by officers.
6. Projected capital expenditures.

How These Information Items Were Used:

The information items rated important were used as follows:

1. Failing to find such information led BLOs to request additional information.
2. The existence of long-term liabilities was used by BLOs to initiate a search for a description of collateral, terms of repayment, past repayment history, etc.
3. The decision process (for family owned companies) would not continue without information item No. 5 above..

To summarize the difference in use of information items rated very important and those rated important, it is noted that the former are decision making items while the latter are either (a) attention directing or (b) decision making items in the presence of certain cues.

¹²Through a debriefing session with one BLO following the termination of his decision, Stephens learned that the information in the following quotation was also important: "Who is the lender of the long-term debt? If it is another bank, it means that you are sharing deposit balances, which you don't want to do because if you get all the deposit balances you enhance your yield. Also, a company of this size [\$1 million in assets] should not have more than one lender, especially if it is unsecured long-term debt. However, if the lender was an officer of the company, that would be alright. If it was a finance company, I would be even more concerned than if it was a bank. If it was an insurance company, then I'd like to see the default covenants, if any existed, so that I include similar covenants in my loan commitment."

(d) Financial Statement Analysis

From the above discussion it is clear that one of the most important activities of a BLO, in his use of financial information en route to a decision, is financial statement analysis. Bernstein [1978, p. 3] defines financial statement analysis as:

"the judgmental process which aims to evaluate the current and past financial positions and results of operations of an enterprise with the primary objective of determining the best possible estimates and projections about future conditions and performance."

He describes the detailed process of financial statement analysis as consisting of:

"the application of analytical tools and techniques to financial statements and data in order to derive from them measurements and relationships which are significant and useful for decision making." [p. 40].

These analytical tools and techniques of financial statements include: comparative financial statements, index-numbers trend series, common-size analysis, ratio analysis, and special purpose analytical techniques such as forecasts, analysis of changes in financial position, and breakeven analysis.

A text in financial statement analysis for bankers, O'Malia [1976, p.4], states that "two things are necessary to have a good loan: first, know where the money is going, and second, know how it is going to be paid back." Financial statement analysis plays an important role in the banker's assessment of the probability a loan will meet the latter standard. In his work, as RMA (1978) observe, the BLO is trying to predict the future, i.e., will a particular loan be repaid as scheduled or not? Since there is no certain answer to this question at the time the credit is being considered, the loan decision, its terms, and its price, will reflect the degree of confidence the lender has in the estimates made. This confidence will be enhanced by applying the techniques of financial statement analysis described above to the

past financial reports of the borrower.

As Kreps and Wacht (1978) observe, if the loan is to be repaid, the BLO must identify the possible sources and timing of funds flows for repayment. Since repayment must be made with cash, the BLO must determine how and when the cash will be generated to repay the loan (along with other demands for cash, e.g., purchase of new fixed assets to replace old ones, payment of dividends, etc.). Information on the CC of existing fixed assets may help the BLO in making this determination. This study will empirically test whether the disclosure of CC data under SFAS 33 appears to be used by BLOs in making their decisions.¹³

Financial Ratios Used by Bank Loan Officers

The most important analytical technique of financial statement analysis used by BLOs is financial ratio analysis. Skilled analysts using these ratios can obtain a better understanding of a firm's condition and performance than they would from analysis of financial data alone. As RMA (1978) observe, the work itself involves two types of comparisons: internal and external.

Internal comparisons are firm-specific ratios. They include computation and analysis of present, past and future projected ratios for the firm in question. Initially, financial ratios and other data are placed on a spread sheet such as the one shown in Exhibit D-6 in Appendix D. The arrayed data cover a number of years and permit the analyst to compare the current figures with past data and to note movements or trends in the statistics which may have significant implications for the future.

External comparisons contrast the ratios of a given firm with those of similar firms or with industry averages.

¹³That is, if SFAS 33 data affect lending decisions, it may be assumed that BLOs have used these data in reaching their decisions.

Empirical research relating to the use of financial ratios by BLOs reveals that there is no one set of ratios that is generally agreed upon (by the majority of BLOs surveyed) to be the most important.¹⁴ Furthermore, previous research which investigated the usefulness of financial ratios as predictors of business failure did not result in one set of financial ratios. These observations are supported by a summary of previous research in this area as shown in Exhibit III-8.

A closer look at Exhibit III-8 reveals that only 10 out of 51 ratios appeared in 5 or more out of 15 different studies, while 22 ratios appeared in only 1 or 2 studies. Table III-2 presents the 10 most often used ratios and the number of studies in which they appeared out of a total of 15 studies.

Table III-2
The Most Commonly Used Ratios in Statistical Studies

Financial Ratio	Number of Studies (out of 15) In Which It Appeared	% of Total of 15 Studies
1. Current Ratio	13	86.7%
2. Net Operating Profits/Total Assets	11	73.3
3. Quick (Acid-Test) Ratio	9	60.0
4. Sales/Net Working Capital	7	46.7
5. Net Worth/Total Debt	7	46.7
6. Sales/Inventory	7	46.7
7. Working Capital/Total Assets	6	40.0
8. Total Debt/Total Assets	6	40.0
9. Sales/Accounts Receivable	5	33.3
10. Sales/Net Worth	5	33.3
All Other Ratios [41]*	5	33.3

* Of these, 8 appeared in 4 studies, 11 appeared in 3 studies, 8 appeared in 2 studies, and 14 appeared in only one study.

Framework of the Decision Making Model of Commercial Bank Loan Officers

From the discussion in this chapter a framework of the decision making model of commercial BLOs may be outlined as in Exhibit III-9.

¹⁴It should be noted, however, that each empirical researcher presented what he felt to be an important list of ratios to BLOs' decision making. Nevertheless, BLOs may not feel the same. That is, in a way, BLOs may have been forced to choose from among the ratios presented to them, leaving out ratios that may be important to them but were not on the list.

Financial Ratios Used in Statistical Studies

Financial Ratios Grouped by Major Areas	Elam (1965)	Horrigan (1965)	Beaver (1966)	Altman (1968)	Ewert (1968)	Makeover (1971)	Deakin (1972)	Edmister (1972)	Felton (1973)	Chesser (1974)	Lerro & Lee (1974)	Libby (1975)	Altman et al (1977)	Included in Dun & Bradstreet Ratios of Manufacturing ¹⁵	Included in RMA Annual Statement Studies ¹⁶	Total out of 15
Short-term Liquidity Ratios:																
Current Ratio	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	13
Quick Ratio	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	9
Cash & Marketable Securities/Current Debt	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Cash & Marketable Securities/Total Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Working Capital/Total Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Inventory/Net Working Capital or Current Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Cash Flow/Debt Service	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Cash Flow/Current Liabilities	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Cash Flow/Total Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Cash Flow/Net Worth	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Cash Flow/Total Debt	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Cash Flow/Sales	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Quick Assets/Total Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Current Assets/Total Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Long-Term Solvency Ratios:																
Times Interest Earned	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Net Worth/Long-term Debt	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Total Debt/Net Worth	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Net Worth/Fixed Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Total Debt/Total Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Common Equity/Total Capital	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Equity & Long-term Debt/Fixed Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Current Liabilities/Total Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Long-term Liabilities/Total Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Current & L.T. Liab.+Preferred Stock/Total Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Long-term Liabilities/Current Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Market Value of Equity/Book Value of Debt	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Turnover (or Activity) Ratios:																
Sales/Cash & Marketable Securities	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Sales/Accounts Receivable	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Sales/Inventory	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Sales/Working Capital	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Sales/Total Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Sales/Quick Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Sales/Current Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Sales/Fixed Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Sales/Net Worth	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Receivables/Net Sales Per Day	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Cash Interval	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Defensive Interval	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
No Credit Interval	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Profitability Ratios:																
Net Operating Profit/Sales	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Net Income/Sales	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Net Operating Profit/Total Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Net Income/Total Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Retained Earnings/Total Assets	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Net Operating Profit/Net Worth	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Net Income/Net Worth	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Net Operating Profit/Total Debt	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Net Income/Total Debt	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Earnings Stability	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
General:																
Trend in Working Capital	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
Trend in Before and After Tax Profits	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	14
TOTALS	29	28	6	2	1	2	1	6	5	10	3	6	9	18	173	

* Used the inverse of the ratio.

¹⁵Prepared by Business & Economics Division of Dun & Bradstreet. Reported annually in Dun's Review.¹⁶Prepared by RMA and reported annually in a volume entitled Annual Statement Studies (Year).

Exhibit III-9Framework of the Decision Making Model of Commercial Bank Loan OfficersA. Objectives of the Model:

1. Minimizing the bank's risk.
2. Maximizing the bank's profits.
3. Maximizing the bank's service to the community.

B. Most Important Business Factors Considered in Lending Decisions:

1. Sales and earnings trends.
2. Cash flow trend.
3. Short-term liquidity.
4. Long-term solvency (including capital, leverage, and asset mix).
5. Profitability and its trend.
6. Overall financial strength.

C. Most Important Non-business Factors Considered in Lending Decisions:

1. Management's: professionalism, character, integrity, experience, depth, reputation, personality, influence, and commitment to planning, control, and civic responsibilities.
2. Loan's: type, amount, purpose, maturity, collateral, interest rate, payout schedule, and sources of repayment.
3. Bank's: objectives & responsibilities, share in the risk, mandates from regulatory authorities, and legal & policy restrictions.
4. Bank and Borrower Relationship: history of relationship, short-term & immediate deposit relationship, and prospects of long-term banking relationship.
5. General: economic and industry conditions (including competition, diversification, market size, and elasticity of demand & supply).

D. Specific Financial Information Items Most Important to Lending Decisions:Income Statement Items:

1. Total revenue and revenue recognition method.
2. Cost of goods sold.
3. Depreciation expense and its method of calculation.
4. Other operating expenses (amount and breakdown).
5. Operating income.
6. Interest expense.

Balance Sheet Items:

7. Accounts receivable: amount, aging schedule, and allowance for doubtful accounts.
8. Inventory: amount, breakdown (raw materials, work-in-process, and finished goods), and valuation method.
9. Total current assets.
10. Tangible assets broken down by category & related accumulated depreciation.
11. Total assets.
12. Accounts payable.
13. Total current liabilities.
14. Total Liabilities.
15. Amount and breakdown of preferred stock and long-term debt by type, dividend and interest rate, and maturity.

Working Capital Statement:

16. Statement of changes in financial position.

Exhibit III-9 (Continued)Other Items:

17. Dependence on a few customers.
18. Cash flow projections.
19. Changes in accounting methods.
20. Contingent liabilities and commitments.
21. Information about consolidated and unconsolidated subsidiaries and nonsubsidiary investees.

E. Financial Ratios Most Commonly Used in Lending Decisions:Short-term Liquidity Ratios:

1. Current ratio.
2. Quick (Acid-test) ratio.
3. Working Capital/Total Assets.

Activity (Turnover) Ratios:

4. Sales/Total Assets (or Asset Turnover).
5. Sales/Accounts Receivable.
6. Sales/Inventory.
7. Sales/Working Capital.
8. Sales/Net Worth.

Long-term Solvency Ratios:

9. Times interest earned (or interest coverage) ratio.
10. Funds Flow from Operations/[Interest+Principal Payment Requirements].
11. Total Debt/Net Worth.
12. Total Debt/Total Assets.

Profitability Ratios:

13. Operating Profits/Sales.
14. Net Operating Profits/Total Assets.

F. Procedures Most Commonly Followed in Lending Decisions:

The following procedures are usually followed, in the order given, taking the objectives of the model (Item A above) into consideration at all times:

1. Evaluation of the borrower's relationship with the bank (Item C.4).
2. Evaluation of the borrower's credit worthiness (Using items B, C.1, C.5, D, and E above).
3. Evaluation of the bank's factors (Item C.3).
4. Evaluation of the loan's factors (Item C.2).
5. Detailed recommendations: recording and filing.
6. Follow-up and review.

Following are some observations relating to the model:

Sequential Steps in Decision Making:

The decision making model of BLOs usually includes the following sequential steps:

Step (1): Determining whether the information received from the credit applicant is adequate prior to beginning a decision process. Information adequacy usually means 'properly prepared financial statements.'

Step (2): Using certain cues to establish a decision context which enables a subset of the initially gathered information to be viewed as important.

Step (3): Using the 'important' information subset to make assessment of the credit worthiness of the applicant.

Standard Operating Procedures (SOPs) and Implicit SOPs:

BLOs are faced with the task of evaluating business organizations. Using information in making decisions and documentation of these decisions are criteria required by both standard operating procedures (SOPs) of banks and bank regulatory authorities [Baugham and Walker (1966), Holt (1977), and Casey (1978)]. The financial statements represent a structured set of information about business organization which has proven useful to BLOs for both of these criteria [Stephens (1978)].

The explicit SOPs of banks require the collection and recording of large amounts of financial statement information. Stephens (1978) found that not all of this 'score card' information is used by BLOs en route to a decision. BLOs seem to have learned from experience (and/or training) to process only certain accounting information. [See Exhibit III-7 for information items considered 'very important' and 'important' by BLOs]. This processing was found to consist of heuristic (incapable of proof) procedures such as conversion to financial ratios. Accounting information was also found to perform another function within such a decision process, namely an 'attention directing' function which stimulates a decision maker to process, or search for,

additional information. The use of these heuristic procedures by BLOs represents certain implicit standard operating procedures (ISOPs).

Auditor's Opinion and Bank Loan Officer's Decision Making Process:

Through personal interviews during the pilot testing phase of this research project and from actual responses to the questionnaire, it was learned that BLOs consider the auditor's opinion to be an important factor in the credit decision process. Furthermore, Stephens (1978) found that auditors' opinions play an important role in determining which ISOPs concerning financial statement information processing can be relied upon. This indicates the importance of auditors' judgments in the decision process of users of financial statements. This point is important to this study since inflation effects disclosures under SAFS 33 are usually labeled "unaudited." To dilute the difference in importance accorded audited and unaudited information, the inflation effects disclosures in the financial statements of the company used in this project are not labeled "unaudited."

ISOPs, Concepts, and Syntactic Context:

In using ISOPs, BLOs make use of concepts from accounting to process information on past operations of firms en route to their decisions. In their use of these concepts, BLOs have adopted 'operational definitions' such as "inventory turnover," "working capital," and "income." [Stephens (1978)].

Sterling (1970) has criticized one of these concepts, "income," because it is not empirically tested, i.e., there is no object against which the "income" output of accounting systems can be compared for objective validity. However, Stephens (1978) found that BLOs are not only able to utilize the concept in their decision process but they insist upon having it available to use it in their decisions. In fact, "income" for sophisticated

financial decision makers such as BLOs seems as real as "redness," "gravity," or "health" as to others.¹⁷ Of course, such objects are tainted with problems of semantic perception even in accounting [Haried (1972)]. This, However, does not reduce their usefulness or at least it does not reduce their use in financial decision processes by sophisticated users of accounting information [Stephens (1978)].

ISOPs and Information Overload:

Fertakis (1969), Revsine (1970), and Casey (1978), among others have been concerned with the effects of "information overload" on users of financial statements. However, Stephens (1978) concludes that BLOs are not affected by this information overload. Each BLO requested and processed a large amount of information relative to amounts considered to bring information overload.¹⁸ Stephens argues that processing such large amounts of information seems possible because of the ISOPs used by BLOs. These ISOPs provide for selection of components and information to be used in decision making.

How Bank Loan Officers Make Their Decisions?

Cohen et al (1966) observe that the loan evaluation process generally seems to be handled by particular set of heuristics. These heuristics lead to "satisficing" behavior, i.e., choosing the best alternative which has been found after a limited period of research. The particular sequence of stages associated with a business loan (formal application, periodic review, etc.) is precisely the type of circumstance which requires banks to make choices before all alternatives are specified and all possible outcomes are known. In such a situation, an adaptive mode of behavior is the typical pattern.

¹⁷ In other words, accounting information provides ontological reality to the concepts. BLOs do not have to be able to technically define such concepts in order to recognize and use them in their decision processes. See Quine (1972).

¹⁸ As pointed out earlier, there seems to be some contradiction in Stephens study since he concludes in another part of his dissertation that his results are consistent with studies supporting the existence of information overload.

Lev [1974, p. 102] confirms Cohen et al's view in part:

"Most financial decisions are currently made in a heuristic and informal manner. Data are usually collected and evaluated, yet the final decision often seems to be made on intuitive grounds (sometimes referred to as judgment) rather than formally integrated with the data collection process. For example, the process of a bank lending decision usually involves an extensive analysis of the applicant's financial data. However, both the evaluation of the data and the final decision are based mainly on the BLO's experience and intuition."

Payne [1976, pp. 366-87] observes that even though BLOs use financial ratios and other estimates in their decision making process, they do not use weights for these ratios.¹⁹ They use instead a noncompensatory process which compares each component of the dimension with an internal or external standard.

Stephens (1978) concludes that BLOs, in their use of financial ratios, seem more interested in obtaining "coarse" indications than a weighted average for judgment. With the instability of financial ratios across time and the complexity of modern business organizations, such a use would seem intuitive. Thus, as Deakin (1976) observed, the ultimate test of the value of a model of financial ratios lies not in its adherence to certain data assumptions, but, rather, in its adherence to its usefulness in decision making.

One would expect that BLOs develop, in their decision processes, expectations and distributions of future cash flows of potential borrowers. These expectations and distributions should improve BLOs' practice and training and allow for weightings of return and risk to be structured. However, Stephens found that no such expectation (estimate) and distribution (uncertainty) were observed in the decision making process of BLOs. While an analytical model of future cash flow can be constructed, BLOs seem to use more heuristic procedures.

This chapter presented the decision making model of commercial-lenders. The following chapter determines whether SFAS 33 disclosures fit into this model.

¹⁹ Use of weights for a group of ratios implies a compensatory decision making process.

CHAPTER IV

ARE SFAS 33 DISCLOSURES HELPFUL TO LENDERS IN MAKING THEIR DECISIONS?

This chapter presents a theoretical determination as to whether SFAS 33 disclosures are helpful to credit grantors in making their decisions. More specifically, it presents an attempt to theoretically determine whether SFAS 33 data fit into the decision making model of commercial lenders as developed in Chapter III. Accordingly, this chapter is structured as follows: First, a detailed theoretical analysis of SFAS 33 disclosures is presented. Second, the reasons why these disclosures are believed (particularly by the FASB) to help lenders in making their decisions are analyzed. Finally, a determination is made as to whether SFAS 33 disclosures fit into the decision making model of commercial lenders.

Analysis of SFAS 33 Disclosures

SFAS 33 requires certain large public enterprises¹ to disclose certain inflation effects. These disclosure requirements are classified into 3 types:

- A. Constant Dollar (CD) Information.
- B. Current Cost (CC) Information.
- C. Five-year Summary of selected CD and CC Information.

Following is a further discussion of these disclosure requirements.

A. CD Information

Enterprises subject to SFAS 33 are required to disclose:

- (a) Information on income from continuing operations for the current fiscal year on an Historical Cost/Constant Dollar (HC/CD) basis.
- (b) The purchasing power gain or loss [PPG(L)] on net monetary items for the current fiscal year.² [SFAS 33, Para. 29].

¹Those with inventory and gross property, plant & equipment (PPE) in excess of \$125 million or total assets in excess of \$1 billion.

²The FASB warns that (b) shall not be included in (a) above. However, if the recoverable amounts of inventory and PPE are lower than their HC/CD amounts, the difference should be charged to income from continuing operations. Also, an enterprise that chooses to present comprehensive financial

In the computation of the above disclosures, the average level over the fiscal year of the Consumer Price Index for all Urban consumers (CPI-U) should be used to restate, as a minimum, inventory, PPE, cost of goods sold (COGS), and depreciation expense. An enterprise that chooses to make comprehensive restatement may use either average CPI-U or end-of-year CPI-U.

B. CC Information

Enterprises subject to SFAS 33 are required to disclose:

- (a) Information on income from continuing operations (IFCO) for the current fiscal year on a CC basis.
- (b) The CC amounts of inventory and PPE at end of the current fiscal year.
- (c) Increases or decreases for the current fiscal year in the CC of inventory and PPE, both before and after eliminating the effects of general inflation.³ [Para. 30 and 56].

In the computation of the above disclosures, the CC of goods sold shall be measured at date of sale, and the CC of depreciation expense on the basis of average CC of PPE for the period.⁴ For minimum disclosure requirements, other revenues, expenses (including taxes), gains and losses may be the same as reported in the primary statements. An enterprise that chooses to present comprehensive CC/CD financial statements may use either average for the year or end of year dollars. In either case, no inter- or intra-period tax allocations are required.

The increases and decreases in the CC of inventory and PPE represent the differences between the measures of these assets at their 'entry dates' (beginning of year or date of acquisition) and 'exit dates' (end of year or statements on a HC/CD basis measured in end-of-year dollars may, and in theory should, include PPG(L) on net monetary items in calculating net income.

³The FASB warns that (c) should not be included in (a).

⁴COGS measured on a LIFO basis may provide an acceptable approximation of the CC of goods sold, provided that the effect of any decreases in inventory layers is excluded.

date of sale or use).

It should be noted that even though the FASB allows the use of average-for-the-year dollars, it requires disclosing the changes in CC of inventory and PPE as of the end of the year.

The CC of inventory is the CC of purchasing (or of the resources required to produce) the goods concerned. The CC of PPE is the CC of acquiring the same service potential (indicated by operating costs and physical output capacity) as embodied by the asset owned.

The CC of a used asset may be measured by the CC of:

- a. a used asset of the same age and condition as the asset owned;
- b. a new asset with the same service potential as the used asset when it was new, and deducting an allowance for depreciation;
- c. a new asset with a different service potential and adjusting that cost for the value of the differences in service potential due to differences in life, output capacity, nature of service, operating costs, and of course, deducting an allowance for depreciation. [SFAS 33, para. 58 and 180].

The CC information may be based on indexation (internal or external), or direct pricing (current invoice prices, vendors' price lists or other quotations or estimates) or standard manufacturing costs that reflect CC. It may be applied to single items or broad categories as appropriate in the circumstances.

The accounting principles used in computing HC/CD or CC income shall be the same as those used in computing HC/ND income unless the methods used in computing the latter were chosen partly to allow for expected price changes. In the latter case, different accounting principles may be used for the purpose of HC/CD and CC calculations. [SFAS 33, para. 61].

Also, if the recoverable amount of inventory, PPE, COGS, and depreciation expense is lower than their HC/CD or CC amounts, the recoverable amounts

should be used. [Para. 62].

It is observed that SFAS 33 allows considerable flexibility in choice of sources of information about CC. SFAS 33 also encourages simplification in computations and other aspects of implementation. For example, 'recoverable amounts' need be measured only if they are judged to be significantly and permanently lower than HC/CD or CC amounts. That situation is unlikely to occur very often.

C. Five-Year Summary of Selected Financial Data

Enterprises subject to SFAS 33 are required to disclose the following information for each of their five most recent years:

1. On an HC/CD Basis:

- (a) Net sales and other operating revenues.
- (b) Income from continuing operations (IFCO).
- (c) IFCO per common share.
- (d) Net assets (i.e., shareholders' equity) at fiscal year end.
- (e) PFG(L) on net monetary items.
- (f) Cash dividend declared per common share.
- (g) Market price per common share at fiscal year end.

2. On a CC Basis:

- (h) IFCO.
- (i) IFCO per common share.
- (j) Net assets at fiscal year end.
- (k) Increases or decreases in CC amounts of inventory & PPE, net of inflation.

3. Other Information:

- (l) Average or end-of-year level (whichever is used for the measurement of IFCO) of the CPI-U.

The information contained in the above 5-year summary may be stated either in (a) average or end of current year dollars, or (b) dollars of the

base period used by the Bureau of Labor Statistics in calculating the CPI-U (currently 1967).

If minimum disclosure requirements are presented, then net assets at fiscal year end will be the amount reported in the primary financial statements adjusted for the differences between HC/ND and HC/CD or CC/CD (or lower recoverable amount) of inventory and PPE. If comprehensive supplementary statements are presented, net assets at fiscal year end (on HC/CD or CC/CD basis) may be reported in accordance with the comprehensive statements.

It should be noted that SFAS 33 requires net assets at year end even if average year dollars are used. This may be somewhat confusing to some people since monetary assets and liabilities at end of year will have to be reduced (in case of rising CPI-U) to mid year dollars.

Why Are SFAS 33 Disclosures Believed to Help Lenders in Making Their Decisions?

The reasons why the FASB and others believe that SFAS 33 disclosures are helpful to lenders in making their decisions can be traced to various sources: (a) SFAS 33 itself; (b) letters of comment, received by the FASB, on the Exposure Draft (ED) prior to issuing SFAS 33; (c) FASB Discussion Memorandum (DM) on reporting funds flow, liquidity and financial flexibility; and (d) the accounting literature. The following is a detailed discussion of these reasons.

A. Reasons Indicated in SFAS 33 Itself

SFAS 33 did not delineate the reasons why and in what way its disclosures should help lenders in their decisions. Rather, SFAS 33 grouped lenders with investors and others and proceeded to explain why the disclosures are helpful to them in general. Paragraph 3 of SFAS 33 states:

"The users of financial reports need to have an understanding of the effects of changing prices on a business enterprise to help their decisions on investment, lending and other matters. This statement is intended to help users in the following specific ways:" [Emphases added].

The Statement referred to assessments of (a) future cash flows, (b) enterprise performance, (c) erosion of operating capability, and (d) erosion of general purchasing power. These elements were discussed earlier under the theoretical background in Chapter I. Following is some further elaboration on these elements, with special emphasis on the assessment of future cash flows.

(a) The Assessment of Future Cash Flows

As indicated in Chapter III, there is no question as to the usefulness of the assessment of future cash flows (FCFs) to lending decisions. The question is why the FASB believes that SFAS 33 disclosures will help lenders in assessing FCFs. Following are some of the answers to this question as summarized from paragraphs 116-155 of SFAS 33:

(1) CC income from continuing operations, or what is termed in the accounting literature 'current operating profit (COP)', reflects CC margins⁵ which may be useful for assessing FCFs particularly if the selling price of a product is closely related to its CC at date of sale.

(2) Under the CC basis, the results of continuing operations and holding activities are separated (i.e., COP is shown separately from the increase or decrease in the CC of assets held, known in the accounting literature as holding gain or loss). This separation may be useful for assessing FCFs since the two activities are affected differently by economic forces.⁶ SFAS 33 data will make it easier to take account of the various forces shaping the time pattern of operating income and changes in CC amounts.⁷

⁵That is, sales revenues less the CC of inputs.

⁶Furthermore, some [e.g., Revsine (1973)] believe, as will be discussed later, that future COP may be easier to predict than future increases or decreases in CC amounts.

⁷Some people argue that the holding of assets is normally necessary for the continuation of business activities and thus holding gains or losses and

(3) CC (or lower recoverable amounts) represent a conservative measure of the net present value (NPV) of FCFs from the use of the assets because NPV represents the maximum price at which purchase of an asset would be worthwhile. Competitive market forces normally cause CC to have a closer and more stable relationship than HC to NPVs.⁸

(4) Even though COP does not measure the maintenance of an enterprise's operating capability exactly because it does not allow for monetary working capital and leverage adjustments⁹, the difference between dividends paid and COP provides an indication of changes in operating capability. An excess of dividends over COP indicates that operating capability has decreased and vice versa. Even though an enterprise will not normally wish to maintain its operating capability (OC) at a constant level over time¹⁰, users who wish to assess FCFs may find it helpful to have information from which they can assess whether OC has changed during a fiscal year. For example, a decrease in OC may be an indication that FCFs will probably decrease.

(5) An increase in CC of assets held by an enterprise represents an increase in its financial investment. Presumably, an enterprise can expect to COP are joint effects and their separation is therefore invalid. [See, for example, Drake and Dopuch (1965) and Prakash and Sunder (1979)]. However, the FASB believes that this argument is outweighed by the counter arguments above. Moreover, the holding period is not absolutely fixed. It may be varied to take advantage of favorable buying opportunities that may not recur, and it is useful to disclose separately the results of such opportunities.

⁸The FASB's argument may be further explained as follows: If we know CC and if we consider it the best surrogate for NPV, then we only need to know an appropriate discount rate and an estimated life for the asset to assess FCFs. The discount rate and an asset's economic life are normally estimated (even under the HC basis) with a reasonable degree of accuracy.

⁹An enterprise may need to increase its monetary working capital (W/C) to maintain its operating capability (W/C adjustment) and/or may be able to obtain some of the capital required to maintain operating capability (OC) by borrowing (leverage adjustment) or by raising new equity capital from external sources.

¹⁰Decisions on the desired level of OC depend on rates of increase in the costs of resources used by the enterprise, the strength of demand for its products, the opportunities for commencing new lines of business, and other factors, beside dividend policy.

earn a rate of return on that additional investment. Hence, information on changes in CC amounts represents a basis for assessing changes in FCFs and related returns on investment.¹¹

(6) The measurement of CC amounts may be useful for the assessment of FCFs in another, more general manner. When users wish to assess FCFs, they will often examine the components of financial statements in detail rather than focusing on summary measures such as income from continuing operations. CC of goods sold, CC depreciation, and CC of inventory and PPE will incorporate more up-to-date information about the prices of resources used by an enterprise than the corresponding HC amounts. Information based on current prices may provide a more useful basis than HC amounts for assessing future prices of the resources concerned and hence for assessing FCFs.

(b) The Assessment of Enterprise Performance

If measurements of assets at CC (or lower recoverable amounts) are regarded as surrogates for measurements of the NPV of FCFs, it follows that a basis for the assessment of an enterprise performance during a period may be provided by an income measurement that reflects changes in CC or lower recoverable amounts. Even though COP does not reflect those changes, they are reported separately and may be added to COP by those users who wish to assess the overall performance of an enterprise during the fiscal year. In assessing the overall performance, users should take into account changes in market conditions governing the prices of assets held by the enterprise since those changes may affect the extent to which changes in CC are associated with changes in expected FCFs.

¹¹ Lucas [1981, p. 14] explains this in a different way: "If the CC of an asset has increased, it may be because the asset can be used to earn more than previously and, therefore, people are willing to pay more for it. Thus, increases in CC of assets held by a company may provide a clue to the increases in the cash flows and earnings that the asset will be able to generate in the future."

(c) The Assessment of the Erosion of Operating Capability

The erosion of OC may be regarded as the failure to retain sufficient financial resources to acquire the assets needed to maintain the capacity of an enterprise to provide a constant supply of goods and services. This concept of capital erosion may be linked to the concept of distributable income. COP provides a basis for users' assessment of distributable income.

(d) The Assessment of the Erosion of General Purchasing Power

(1) The main purpose of investment by shareholders and others is to earn a return (in cash and in amounts that have a consistent pattern over time) to meet personal expenditures, particularly if these are fixed in nature. Investors are also concerned with the future general purchasing power (GPP), which declines in times of inflation, of the cash they receive. An assessment of the future GPP available as a result of past activities would have to take account of possible changes in rates of return and in rates of inflation. CD information disclosed under SFAS 33 may provide a useful basis for users' assessment of such factors.

(2) The rate of return on investment is commonly used as a measure of investment performance. Investors who are concerned with GPP may want to compute their rate of return by dividing CD income by CD investment. A shareholder cannot expect to obtain a net increase in GPP in the long run if the corporation does not increase the GPP equivalent of its net assets. SFAS 33 requires the disclosure of CD net assets over a 5-year period.

(3) The reporting of GPP gains or losses on net monetary items under SFAS 33 may provide an improved understanding of some of the implications, in periods of inflation, of the monetary components of W/C and the amount of debt included in the capital structure of the enterprise. GPP gain or loss is also another part of the information that may be useful for the

assessment of the performance of an enterprise in maintaining the GPP of investors' capital. For instance, the total increase or decrease in purchasing power resulting from the activities of an enterprise may be assessed on the basis of the sum of COP, changes in CC amounts of inventory and PPE net of inflation, and the GPP gain or loss on net monetary items. [See, for example, Lucas, 1981, pp. 35-36].

B. Reasons Indicated in Letters of Comment on the Exposure Draft Prior to Issuing SFAS 33 (ED)

All letters of comment on the ED prior to issuing SFAS 33 [427 in all and classified by source as shown in Table IV-1]¹² were reviewed by this researcher in an attempt to discern the reasons, if any, the proposed disclosures may be helpful in lending decisions.

Based on this extensive review, the following general observations may be made:

(a) The majority of industrial (non-financial) companies' letters were trying to persuade the FASB to abandon the project. The reasons for this are two-fold: (1) fear of potential excessive costs of implementing the required disclosures, and (2) difficulty of implementation. Most of these companies stated that if the FASB will go ahead with the project anyway, they would prefer CD over CC data. Obviously, CD data are less costly and easier to prepare than CC data. Some companies rationalized their opposition to the project by stating that it would be confusing to investors. Most of these companies based their arguments on an article by a Stock Investment Analysis Co. [Salomon Brothers]. Indeed, one of the companies attached a copy of the article with the letter of comment. Following are some excerpts from that article:

¹²These letters of comment are available in the public files at the FASB headquarters in Stamford, Connecticut.

Table IV-1

Letters of Comment on the Exposure Draft
[Classified by Source]

Occupational Category	Number of Letters Received by the FASB	Including	
		Letters Representing Societies or Institutes	Letters Requesting Oral Presentation at the Public Hearing
Industry	287	20 ^a	2
Academe	40	--	3
Banking	38	5 ^b	1
Public Accounting	32	10 ^c	1
Securities	8	1 ^d	1
Government	6	2 ^e	-
Other	16	--	-
TOTALS	427	38	8

^aMostly industry associations but include the Financial Executive Institute.

^bMostly bank associations but include Robert Morris Associates.

^cMostly CPA societies but include the National Association of Accountants and the American Institute of Certified Public Accountants.

^dThe Boston Security Analysts Society, Inc.

^eThe Federal Home Loan Bank Board and the Association of Government Accountants.

Salomon Brothers (April 1979), referring to the ED, argue that the whole project is merely an 'academic exercise' that will confuse investors and will be neglected by analysts as they neglected ASR 190 RC disclosures.

To quote:

"Much of the effort, however ultimately structured, will undoubtedly tend to impair earnings and create greater confusion and uncertainty about equity investments. Serious investors will be confronted with a multitude of EPS figures, and will have to pick and choose as to which set properly reflects the earnings power of a company. Moreover, since taxes will still be paid on the former basis, the whole exercise is merely academic in nature until such time as the tax calculation is changed. (Don't hold your breath). We suspect that the new proposals will receive no more attention from analysts than the previous SEC guidelines dealing with RC accounting"

(b) The majority of financial institutions (banks, insurance companies, etc.) preferred CD over CC data because most of their assets are monetary in nature. Exhibit D-7-1 in Appendix D presents a part from a letter that is most representative of the view of this majority.

However, the majority of banks preferred CC data (over CD data) to be reported by industrial companies because, in their opinion, they are more relevant to bankers' decision making than CD data. Exhibit D-7-2 in Appendix D presents some excerpts from the most representative letters.

(c) The majority of public accounting firms and CPA societies preferred CD data for still another reason: they are easier to audit, more reliable and verifiable.

Obviously, the word 'majority' implies that there were minor exceptions to these generalizations. For example, in an exception to the view of the majority of CPA firms, one of the big-8 (Ernst & Whinney) preferred CC over CD data and year-end over average year dollars. However, they recommended CD data for financial institutions. Another big-8 CPA firm (Deloitte Haskins & Sells) suggested that dividends distributions be restricted to an alternative earnings concept. By implication, they probably mean COP, and thus they prefer CC data.

(d) The majority of financial analysts preferred CC over CD information because, in their opinion, the former is more relevant to their decisions, and the latter is not only irrelevant but also confusing and meaningless. Exhibit D-7-3 in Appendix D presents some excerpts from the most representative letters.

(e) The academicians were split roughly equally into 4 groups: one group opposed the project for one reason or another; another supported it;

a third favored CD information; and the fourth favored CC information. This is not surprising since academicians, unlike most of the other groups, express their own individual opinion not constrained by the objectives or interests of their organizations.

The Accounting Standards Committee (ASC) of the Boston Security Analysts Society (BSAS), Inc. distributed a questionnaire to selected members of the Society to provide the FASB with a more detailed summary of analysts' opinions regarding the proposed statement. Notwithstanding the small sample (18 financial analysts) of the survey, it indicated that users may benefit from SFAS 33 data in 3 areas: cash flow and dividend analysis, merger and acquisition analysis, and tax-law lobbying. The result of the survey also seems to suggest that Salomon Brothers' conclusion that RC data received little, if any, attention from analysts, and their (Salomon's) suspicion that CC data under SFAS 33 will not fare better, are probably premature. As to their contention that serious investors will be confused because of the multitude of EPS figures, Lucas (1981) does not believe so. He argues that even though having more than one income number is unfamiliar, it is not too complicated to understand, and, in fact, may be useful. The following quote from Lucas [1981, p. 55] may show why this is so:

"The idea that there may be more than one income number is a little unfamiliar but not too complicated. Income may be compared to a child's growth--defined as increase in 'bigness.' We might measure growth as increases in the attribute height or as increases in the attribute weight. We might also be interested in more specific, narrower measure, such as shoe size. To fully understand the growth of a child, we might decide to measure and record both height and weight, and perhaps other attributes. Multiple measures of income may be similarly useful."

C. Reasons Indicated in Discussion Memorandum on Reporting Funds Flows, Liquidity, and Financial Flexibility (DM)

The FASB argues that "changing prices affect funds flows." [DM, p. 69].

It also states that, in certain circumstances, CC data may provide useful information about the funds required to maintain operating capability. These circumstances are characterized by a low level of technological change and by a low level of product obsolescence.

In certain circumstances, COP represents the amount of cash that a business may distribute while retaining enough cash to replace resources used. The usefulness of the CC number (i.e., COP) arises not because it is an income number but because it happens to equal the funds flows available for expansion and distribution. Exhibit D-8 in Appendix D presents a simple numerical example illustrating this point.

Thus, CC data under SFAS 33 might be used as a basis for assessing the funds available for expansion and distribution, i.e., the funds that could be distributed while maintaining the ability of a business to hold a fixed physical quantity of assets, and, hence, to maintain its operating capability.¹³

D. Reasons Indicated in the Accounting Literature (Which the FASB may have indirectly relied on in issuing SFAS 33)

The accounting literature discussing inflation accounting is abundant. Nearly every textbook in intermediate and advanced accounting, and in financial statement analysis, devotes at least one chapter to the subject. Even some introductory accounting texts started to devote a chapter to the subject as well. There are also books which are devoted entirely to the subject. Most important of these are: Edwards and Bell (1961), Revsine (1973), Davidson et al (1976), Largay and Livingstone (1976), Goldschmidt and Admon (1977), Wanless and Forrester, eds. (1979), and Lucas (1981).

¹³ It should be recognized, however, that the determination of the amount of funds available for expansion and/or distribution involves consideration of many other factors including adjustments for: backlog depreciation, monetary W/C, leverage, and economic and technological change. The discussion of these factors are beyond the scope of this dissertation (which focuses on the effects of SFAS 33) since the FASB decided not to deal with them in SFAS 33 largely to reduce its complexity.

The first of these books, Edwards and Bell (1961), is a seminal work in this area and is probably the one that has sparked all other successive works.¹⁴ Revsine (1973) developed a normative model to show why RC accounting is superior to HC accounting for long-term equity investment decisions. However, most of his arguments apply equally well to lending decisions. Lucas (1981) is a small book written in a very simple language that can be understood even by nonaccountants. It is sponsored by the FASB in an effort to aid various groups of people in understanding inflation accounting. The other books mentioned either deal with how to prepare inflation accounting or why it is useful in making investment and lending decisions. The arguments of why inflation accounting information is useful -as presented in these books- are similar to those espoused by Edwards and Bell (1961) and Revsine (1973).

The number of articles dealing with inflation accounting is almost infinite. The bibliography of this dissertation includes a sample of the most important ones.

In this section, the reasons why CC data¹⁵ may be helpful in lending decisions are deduced from the above cited works as well as from other relevant literature.

Edwards and Bell (1961) were probably the first to crystalize the

¹⁴ Although their book presented the most complete analysis of RC income, Edwards and Bell were not the first to recommend separate disclosure of the results of operating and holding activities (the essence of RC and CC accounting models). For example, this dichotomization of income was specifically suggested much earlier by Rorem (1929).

¹⁵ Most of the literature showed that only CC (but not CD) data are helpful in making economic decisions. The perceived usefulness of CD data was limited to making meaningful trend analysis. Furthermore, the review (presented earlier) of the letters of comment on the Exposure Draft prior to issuing SFAS 33 revealed that most users of financial statements (particularly lenders) prefer CC over CD data. Since this dissertation is concerned with the effects of SFAS 33 data on users' (specifically BLOs') decisions, the discussion here is devoted mostly to the theoretical benefits of CC (rather than CD) data to users.

deficiency of HC income. One of their principal criticisms of HC income is that though the matching concept is appropriate in theory, it is inappropriately applied. Certainly, the items and revenues of sale must be matched with the costs of inputs used to generate those sales. Since the costs of inputs are carried on the books at acquisition costs from various periods, the income figure obtained from matching current revenue with these costs is misleading. If input costs were defined as the current prices of obtaining those inputs, then the distortion to the income figure would be removed. This is the rationale behind COP because it (COP) indicates whether or not current revenue from sales is sufficient to cover CC of inputs used to generate the items of sale.

Revsine (1973) equates COP with the distributable operating flows (DOFs) component of economic income. Thus, COP would reflect the maximum amount of resources generated by operations that could be distributed in the current period without reducing the level of future physical operations. Revsine's claim has been disputed, and one of his most vocal critics has been Chambers (1975) who argued that the sum of RC depreciation will not equal the RC of the asset when its life expires, and therefore COP is not distributable.

Castellano (1978) disputed Chambers' argument by showing that a firm with a steady state productive capacity will accrue RC depreciation charges that will provide sufficient funds to replace the productive capacity of whatever assets expire.¹⁶ Castellano also argues that COP should be of great interest to creditors. Indeed, it may be of central importance when a firm seeks additional credit because the creditor is interested in the

¹⁶ Furthermore, Castellano argues, if the asset is viewed as a "bundle of services" to be expended linearly over its economic life at the prevailing market price [Edwards and Bell, 1961], there is no justification for expecting the sum of depreciation charges to equal RC of the asset at the time of its expiration. The firm was able to expense the current market value of asset services as they were consumed. What could be more equitable and efficient procedure?

profitability of the firm in the absence of inflation. While holding gains may be large they will rapidly disappear if inflation subsides. The COP is the profitability level that creditors can be reasonably certain will be available for distributions, unless there are changes in the firm's market. Furthermore, only COP can be distributed and still ensure the long-term viability of the firm.

Scott (1978) argues that long-term equity investors and commercial lenders use accounting and other information to answer two questions:

1. What is the probability of default on each future payment date? and
2. What is the likely settlement value should the company default?

The ability of an enterprise to avoid default on interest or principal is related to the cash generated from operations (CFO). If the CFO is less than the required payments on fixed obligations, the company must either convert assets to cash, or borrow (usually by pledging assets), or issue securities, or default. In the latter case, the settlement value depends on how much cash can be raised through the sale of assets.

Analysts utilize a number of accounting ratios (together with other information) to estimate default probability and settlement value. Scott [1978, p. 25] argues that, in an environment of changing prices, ratios based on HC are unlikely to be as relevant, in this respect, as ratios based on current value (CV). His argument is based on an examination of the information content of three sets of ratios:

1. Coverage ratios: measuring the relationship between income and fixed obligations.
2. Working capital ratios: portraying the ability of an enterprise to generate cash in the short-run (sic)¹⁷

¹⁷Theoretically, working capital measures the excess of current assets over current liabilities, and working capital ratios portray the degree to which current liabilities are covered by current assets at a given moment. See Bernstein [1978, pp. 442-470] for a further discussion of this concept.

3. Capitalization ratios: indicating the degree to which a company is financed with borrowed funds.

Scott shows that CV accounting enhances the above ratios as follows:

1. Coverage Ratios:

These ratios measure the margin of safety by which earnings exceed the fixed obligations in the near future; they portray the extent to which income generated from operations (IFO) may decline before a fixed obligation cannot be paid. Implicit in the use of coverage ratios is that a close association exists between earnings streams and cash flows. The earnings number commonly used in these ratios is earnings before interest and taxes (EBIT).

In an inflationary environment, when replacement of inventory and PPE at higher prices absorbs more of the CFO, the EBIT under HC would not reflect the higher RC and thus coverage ratios will appear higher than they really are. Thus, to evaluate coverage in an inflationary environment, the analyst must be able to reasonably estimate 'maintainable income.'¹⁸ Current values should aid the analyst in this respect since they adjust for inflationary impacts.

2. Working Capital (W/C) Ratios:

W/C ratios are important because fixed payments must be made in cash. W/C ratios normally compare the size of some or all current assets (CA) to some or all current liabilities (CL). The rationale behind these ratios is that such CA as marketable securities, accounts receivable, and inventory can be readily converted to cash in the event of an emergency.

In an inflationary environment, HC amounts of noncash CA do not reflect the amounts at which a firm can raise cash by selling or pledging its CA.

¹⁸ Scott (1978) did not define 'maintainable income,' but the meaning implicit in his discussion is that it is the income reported after allowing for the (higher replacement) costs needed to maintain the physical level of operations without additional external financing. This is also referred to in the literature as 'sustainable income.'

Fixed obligations investors and lenders are thereby deprived of realistic and relevant information about the liquidity of the company. W/C ratios based on CV, on the other hand, communicate more information about the short-run solvency of the firm since CA are adjusted to reflect contemporary values.

3. Capitalization Ratios:

The purpose of these ratios is to communicate the size of the claim that various classes of creditors (and owners) have against the resources of the firm. Much of the interpretation of capitalization ratios centers around settlement value in time of distress. If total assets are large relative to the claims of more senior creditors, lower claim creditors are more likely to receive settlement near par. Since settlement is made in today's dollars, CV rather than HC are most relevant. HC amounts of assets are based on past dates and thus bear little relationship to their liquidation values if price changes have occurred in the interim. Hence, HC numbers do not provide useful information about liquidation values.¹⁹ CV of assets also provide valuable information about the liquidity value of long-term assets. Although the degree of liquidity of these assets typically is less than that of W/C assets, an enterprise with a cushion of fixed assets is better able to arrange quickly sales, loans, or even leaseback transactions to meet immediate cash needs. To all investors and lenders concerned about liquidity, CVs are usually better indicators than are HC of the probable indirect

¹⁹The difficulties that may be caused by this tenuous relationship between HC and CV are reported by Cohen et al [1973, p. 389] in their discussion of capitalization ratios as follows:

"Although it would be nice to send out teams of industrialists, engineers, and real estate appraisers to evaluate corporate assets, this usually is not feasible. Accordingly, the practice has developed among security analysts of using two measures of common stock equity: (1) the book value as shown on the balance sheet, and (2) the market value, derived by multiplying the number of shares outstanding by current market price, or by an average of recent high and low market prices. Where the two measures of equity produce quite different results, the analyst must use his judgment as to which is more representative of realistic asset value."

liquidity aspect of long-term assets.

Revsine (1973) argues that an investor is primarily interested in estimating: (1) future dividend flows, and (2) the risk inherent in these flows. His criterion for the usefulness of accounting measurement bases (HC, RC, etc.) is based on the extent to which a basis facilitates the estimates of future flows and their associated risk. Based on this criterion, he argues that RC is more useful than HC to long-term equity investment decisions for two reasons:

1. Ability of RC Information to Predict Future Cash Flows (FCFs).

DOFs are more stable and hence more predictable. RC is more useful (than HC) because it generates information (i.e., COP) that is useful as a basis for predicting future DOFs.

2. Ability of RC Information to Assess Risk.

Financial ratios computed using RC information provide a better basis (than HC) for assessing risk associated with expected cash flows.²⁰

By analogy, it may be argued that lenders are also interested in estimating FCFs and the risk inherent in those flows. Chapter III has demonstrated that bank lending decision models are, to a large extent, cash flow oriented.

The ability of CC data to predict FCFs better than HC data has been discussed in detail under (A) above [Reasons Indicated in SFAS 33 Itself]. An analysis of why CC ratios may provide a better basis (than HC ratios) for assessing the risk associated with FCFs is presented below as one aspect

²⁰ Revsine used 5 ratios to illustrate his point: the current ratio and times interest earned [reflecting a firm's liquidity-solvency position], and asset turnover, profit as a % of sales, and return on investment [reflecting a firm's profit generating potential]. Why these and other ratios are enhanced using RC or CC data is discussed later on.

of whether SFAS 33 disclosures fit into the decision making model of lenders.²¹

Should SFAS 33 Disclosures Fit Into the Decision Making Model of Lenders?

In this section a determination is made as to whether SFAS 33 disclosures fit into the decision making model of commercial lenders as developed in Chapter III. Making that determination requires that the 'fitting' process be defined first. There are two possible interpretations of this fitting process: (1) SFAS 33 disclosures fit into the decision making model of commercial lenders if, and only if, they are actually used as a part of that model. That is, commercial lenders do use the accounting information adjusted for changing prices as reported under SFAS 33 in computing whatever ratios they compute and in making whatever other analysis they do in order to make their final decisions. (2) SFAS 33 disclosures are assumed to fit into the decision making model of commercial lenders if (a) they provide information that, theoretically, should aid in achieving the objectives or in enhancing the procedures of that model, and/or (b) there is a theoretical justification that these disclosures should enhance the meaning of whatever ratios are used by commercial lenders in reaching their final decisions.

It is not possible to adopt the first interpretation here for two fundamental reasons: (1) SFAS 33 disclosures are relatively new and commercial lenders have not yet had sufficient time (for training) needed to understand the meaning of these disclosures and how they would, or should, if at all, affect their decisions. [It is possible that this training process is going on right now]. (2) Whether or not these disclosures are actually used in commercial lenders' decision making process is an empirical question. Because

²¹ Some performance measures have been proposed by Castellano (1978) which he believes should be enhanced through the use of RC data that were provided under ASR 190. These measures include: average economic life of aggregate assets, average age of aggregate assets, age index, change in asset value, and technological improvement premium. Exhibit D-9 presents a summary and adaptation of these measures using SFAS 33 data and why these data should improve these measures.

of the newness of SFAS 33, no known previous study has addressed this question empirically. Indeed, this research study may be one of the first steps in that direction.

In view of the above discussion, the first interpretation of the fitting process must be rejected. Consequently, the second interpretation is used here.

Using that interpretation, the determination of whether SFAS 33 disclosures fit into commercial lenders' decision making model is made as follows: First, the disclosures are taken item by item and compared to the objectives or the procedures of the model to determine whether each specific disclosure item should theoretically aid in achieving these objectives or enhancing these procedures. Second, the financial ratios that are most commonly used by commercial lenders in making their decisions are analyzed to determine whether their meaning would theoretically be enhanced if SFAS 33 disclosures (rather HC data) were used in their computation.

A. Should SFAS 33 Disclosures Help Achieve the Objectives or Enhance the Procedures of Commercial Lenders' Decision Making Model?

Following is an item by item analysis of SFAS 33 disclosures in an attempt to determine whether they should, theoretically, aid in achieving the objectives or in enhancing the procedures of commercial lenders' decision model.

(a) Income from Continuing Operations (ICO) on an HC/CD Basis

A review of the discussion in this chapter thus far would indicate that this disclosure item is probably of little, if any, benefit to lenders in making their decisions.²² Thus, it would seem as though this item does not fit into the decision making model of commercial lenders.²³

²²This item may be of interest to investors who wish to determine whether their enterprise has been able to maintain the purchasing power of their investment. To commercial lenders, this point is probably of little importance.

²³As indicated earlier, most letters of comment (from users of financial reports) on the Exposure Draft prior to issuing SFAS 33 indicated that CD information not only would be of no benefit but may even be misleading.

(b) The Purchasing Power Gain or Loss on Net Monetary Items

This item may provide an improved understanding of some of the implications, in periods of inflation, of the monetary components of working capital and the amount of debt included in the capital structure of an enterprise.²⁴ Thus, it seems as if this item fits into the decision making model of commercial lenders.

(c) Income from Continuing Operations (ICO) on a CC Basis

This disclosure item may provide great benefits to lenders in making their decisions. A review of why the FASB and others believe that this item should help in making a better assessment of future cash flows supports this contention. To recap here, this item reflects current margins, may be used as a surrogate for distributable income, and is thought to be more stable and, hence, more predictable than HC income. These characteristics help in assessing FCFs and in evaluating the ability of a company to maintain its operating capability, two of the most important factors which lenders consider in making their decisions. Thus, it would seem as if this disclosure item fits into (i.e., is theoretically helpful to) the decision making model of commercial lenders.

(d) The CC Amounts of Inventory and PPE at Fiscal Year-end

This item may help lenders in making their decisions. It may be used as a surrogate for NPV of FCFs from the use of an asset, a factor which aids in

²⁴ Basically, in inflationary periods, the purchasing power of monetary items declines. This means two things: (1) the lender will be repaid in dollars of less purchasing power. [The lender wants to, and usually does, allow for this in the interest rate charged. Normally, the interest rate charged consists of two elements: (a) a risk-free rate, and (b) a risk premium. The risk premium covers, beside other risks, the expected purchasing power loss during the term of the loan. If past and current purchasing power gain or loss of a particular borrower is known, this may aid in understanding the risk inherent in its capital structure and may facilitate a better estimate of this risk in the future]. (2) the capital structure of the firm is usually stronger than the HC financial statements show, and hence the lender may benefit through a better understanding of the customer's risk. However, this benefit is likely to be marginal since capital structure is not the only factor determining the risk of an enterprise.

making a better assessment of FCFs since the discount rate and the economic life of the asset can be reasonably estimated. Thus, it seems as if this item fits into the decision making model of commercial lenders.

(e) Increases or Decreases in CC of Inventory and PPE During Year

This item may help lenders in making their decisions. Separating it from COP makes it easier to take account of the various economic forces affecting each, thus enhancing the assessment of FCFs. Changes in CC amounts may help in the assessment of changes in FCFs. Thus, it seems as though this item fits into the decision making model of commercial lenders.

(f) Five-Year Summary of Selected Financial Data

The decision making model of commercial lenders emphasized trend analysis, particularly sales, earnings, and cash flow trends. Trend analyses using the HC basis may be misleading in times of changing prices. For example, HC sales may have an upward trend even if the trend of sales volume is levelling off or is actually decreasing. Making trends in dollars of constant purchasing power eliminates this distortion. Thus, the 5-year summary of sales and other operating revenues, income from continuing operations (ICO), purchasing power gain or loss, and net assets at year-end [all on an HC/CD basis]; and of ICO, net assets at year-end, and increases or decreases in CC of inventory and PPE, net of inflation [all on a CC basis] seem to be of some help to lenders in making their decisions. Hence, these disclosure items seem as though they fit into the decision making model of commercial lenders. The other data in the 5-year summary, i.e., ICO, cash dividend, and market price [all per common share]; and average or year-end CPI-U, would seem to fit the objectives of investors more than those of lenders. Thus, these other data seem as though they do not fit into the decision model of commercial lenders.

B. Should Financial Ratios Become More Meaningful if Computed Using SFAS 33 Disclosures Rather Than HC Data?

In Chapter III, 14 financial ratios were identified as the most commonly used ratios in lending decisions. [See Exhibit III-9]. In this chapter, an analysis is made to determine whether these ratios would be more meaningful if computed using SFAS 33 disclosures rather HC data. The following approach is used in this analysis: First, the intended purpose of the ratio analysis is specified. Second, some specific ratios that are thought to be relevant to this purpose are identified. Finally, the characteristics of the data used to compute the ratio are examined. Following is some elaboration on this approach.

(a) Purpose of Ratio Analysis

Revsine (1973) argues that for long-term equity investors, the purpose of ratio analysis is to assess the risk associated with FCFs. A review of Chapter III and the previous section of this chapter shows that this purpose applies equally well to commercial lenders.

(b) Ratios Relevant to the Above Purpose

As indicated earlier, Revsine (1973) selected 5 ratios for the above purpose: Current Ratio (CR), Times-Interest-Earned (TIE), Asset Turnover (ATO), Profit as a % of Sales, and Return on Investment (ROI). However, Revsine does not suggest that these 5 ratios are necessarily the best measures of liquidity-solvency position and profit generating potential. Rather, he selected them because they are frequently mentioned in various accounting texts and hence more familiar²⁵. Thus, in addition to these ratios all other ratios in Exhibit III- 9 are analyzed here.

(c) Examining the Characteristics of the Data Used to Compute the Ratios

Examining the data used to compute a given ratio establishes the

²⁵ See Revsine (1973), p. 171, footnote 1.

'theoretical validity' of the ratio. For example, a certain ratio may require a measurement of the ending inventory. Since there are various methods for measuring ending inventory, one must analyze which method of inventory measurement best conforms to the intended purpose of the ratio. After performing many such analyses, one can specify those data that seem best suited to the analytical intent of various ratios. If a ratio is consequently computed using those data, the resultant index does in fact measure what it theoretically purports to measure. Ratios that possess this characteristic are termed 'theoretically valid.'

However, theoretical validity is only one aspect of ratio utility. In addition to the information content of the individual ratio, accounting ratios are also potentially useful because of the opportunities they afford for intertemporal comparisons for a single firm and relative comparisons among firms. Thus, the usefulness of CC ratios²⁶ in making relative comparisons over time and among firms will also be assessed.

Analysis of Individual Ratios

The individual ratios selected are analyzed under different areas: short-term liquidity, turnover, long-term solvency, and profitability. The first ratio in each area is analyzed in detail as a demonstration of the analysis that should be accorded every other ratio in that area. However, to avoid repetition, the analysis of other ratios in each area focuses only on the differences between each ratio and the first ratio analyzed in detail. The analysis of the first ratio in each area depends heavily on the arguments developed in Revsine (1973).

(a) Short-term Liquidity Ratios

(1) The Current Ratio (CR)

²⁶The reasons why the usefulness of only the CC ratios (but not the CD ratios) is discussed here are explained in footnote 15 of this chapter.

Theoretically, the CR reflects the degree to which short-term obligations are covered by current assets at a given moment. However, in practice, it serves many as a rough index or indicator of liquidity [Bernstein et al (1981), p. 82]. Revsine [1973, p. 173] argues that, ideally, the CR should reflect the ability of a firm to meet its short-term obligations. If the CR is used as a rough indicator of a firm's liquidity in the short run, a question immediately arises with regard to the interpretation of this ratio. That is, does the calculation assume that the firm will liquidate current obligations by using current assets (CA) in the normal operating cycle as they are successively transformed into cash, or by liquidating all CA at whatever stage in the cycle they are in?

Fess [1966, p. 266] argues that the normal operating cycle is the better concept to assume. The operating cycle could also be supported by the going-concern concept which is so pervasive in accounting theory. However, Revsine [1973, p. 173] argues that it is possible to counter this position as follows:

"Since the major purpose in computing the current ratio is to provide a basis for judging a firm's survival ability in the face of short-term financial crisis, it seems somewhat self defeating to blithely assume in constructing the ratio that the firm will survive."

Bernstein [1978, pp. 448-52] argues that the CR, as a measure of liquidity and short-term solvency, is subject to serious theoretical and practical limitations, and if it is to be used intelligently, it would have to be used in the liquidation sense. To quote:

"The current ratio is a static or 'stock' concept of what resources are available at a given moment in time to meet the obligations at that moment. The existing reservoir of net funds does not have a logical or causative relationship to the future funds which will flow through it. And yet it is the future flows that are the subject of our greatest interest in the measurement of liquidity. These flows depend importantly on elements not included in the ratio itself, such as sales, profits, and changes in business conditions." [p. 449].

After closely examining the elements comprising the current ratio, Bernstein went on to conclude that:

"The better and most valid way to use this ratio is to recognize its limitations and to restrict its use to the analytical job it can do, that is, measuring the ability of present current assets to discharge existing current liabilities and considering the excess, if any, as a liquid surplus available to meet imbalances in the flow of funds and other contingencies. This should be done with an awareness of the fact that the test envisages a situation of enterprise liquidation whereas in the normal going-concern situation current assets are of a revolving nature, for example, the collected receivable being replaced with a newly created one, while the current liabilities are essentially of a refunding nature, that is, the payment of one is followed by the creation of another." [p. 452] [Last emphasis added while earlier emphases in the original].

While, in theory, the liquidation interpretation of the CR is more convincing, it appears from the discussion of Revsine (1973) and Bernstein et al (1981) that, in practice, many users may still be employing the operating cycle interpretation. Consequently, the following discussion of the usefulness of the CR based on CC data considers both the normal operating cycle and the liquidation interpretations.

The Normal Operating Cycle Interpretation

Fess [1966, p. 268] argues that using the normal operating cycle notion, inventory should be reflected on a present value basis; but the remainder of current assets are usually reflected at their net realizable value as well. Thus, to assess the relevance of CR (based on CC) to users adopting the operating cycle notion, the correspondence between CC of assets and their net realizable value (NRV) must be examined.

SFAS 33 has mitigated this correspondence problem by requiring the use of the recoverable amount if it was lower than CC. The recoverable amount is measured by NRV (if the asset is about to be sold) or value in use (if the immediate sale of the asset is not intended). The first measure applies more to inventory than the second since a firm is normally willing to sell its inventory at any time, even immediately, as long as consumers demand it.

Theoretically, under CC systems, liability carrying values will typically

differ from their HC values only because of interest rate fluctuations. Since liabilities included in the CR have a short life, this adjustment will seldom be material. Furthermore, SFAS 33 did not require adjustments of liabilities.

Thus, on a theoretical basis, because CC (represented by NPV) of inventory is more relevant to decision makers than its HC, it seems that the CC-CR should prove more useful (than HC-CR) to lenders (and investors) if their intent is to determine the ability of the firm to meet its current obligations through normal operating activities.

The Liquidation Interpretation

If the CR is used to determine the margin of safety in the face of near-term adversity, the crucial issue becomes not what the assets will realize through normal operations but rather what the assets will command if financial difficulties necessitate their immediate conversion. If CC data are to be relevant for this use, they must approximate the liquidation value of working capital items. Following is a discussion of whether this is so.

Cash is the most liquid of assets and thus there is no problem with respect to it. Receivables, on the other hand, give rise to some problems since management's ability to accelerate their collection, especially on short notice, is quite limited. Therefore, for short-term liquidation purposes, receivables must generally be assigned or sold at a sizable discount to compensate for the risk and collection expenses. Thus, CC will generally overstate the liquidation value of receivables. Inventory presents similar difficulties. A firm desirous of liquidating its inventories is likely to do so only at a net price that is below the CC of these items.

Thus, it seems that CC will generate W/C values that are of less relevance to the liquidation oriented user. However, this is true under HC reporting as well.

Intertemporal Comparisons

Generally, notwithstanding its limitations, as the CR grows larger (smaller) over time, the liquidity position of the firm should be growing stronger (weaker). The question then is: will the magnitude of CC-CR tend to covary with the firm's liquidity position?

To answer this question, it may be noted that the CR will grow larger for two possible reasons: (1) during a period of stable prices, the magnitude of a firm's CA could increase relative to its CL, and (2) during a period of stable physical magnitude of CA relative to CL, the market value of CA could rise more than that of CL. (Additionally, of course, both types of changes could occur simultaneously). The circumstance in (1) is not at issue here since the analysis is focusing on periods of changing prices. The circumstance in (2) would be true depending on whether there is a covariance between movements in CC and movements in (a) NRVs, and (b) liquidation values. As indicated earlier, SFAS 33 required the use of NRV if lower than CC. Thus, under the CC basis, CC and NRV will be the same and hence intertemporal comparisons would be more meaningful than under the HC basis. Whether CC approximates liquidation value better than HC depends on individual circumstances and cannot be decided without empirical evidence.

Interfirm Comparisons

One of the advantages of CC is that its ratios facilitate more realistic interfirm comparisons than HC ratios because CC is less prone to generating artificial differences that frequently arise among firms when HC is used. To illustrate, consider the case of two firms that are identical in all respects (i.e., each possesses the same physical quantities and types of assets and similar capital structure) except that one uses FIFO and the other uses LIFO. It is quite possible for HC-CRs of these two firms to differ even though the

physical quantities of the W/C items are identical. In contrast, the proponents of the CC basis contend that it gives rise to fewer such artificial differences. As a result, these proponents suggest that CC-CR provides a more realistic basis for interfirm comparisons.

(2) The Quick (Acid-Test) Ratio

Since the quick ratio does not include inventory (which is the only CA that could have a CC significantly different from its HC), it is doubtful that the CC quick ratio (under the normal operating cycle interpretation) will be more meaningful to lenders than HC quick ratio.²⁷ This is so since the CC and HC amounts of the other CA included in the quick ratio will not be significantly different from each other. As to the liquidation interpretation, it was shown under the analysis of the CR that CC (as well as HC) will not be relevant to users.

(3) Working Capital/Total Assets

This ratio is intended to show the mix or, more specifically, what percentage of total assets is represented by working capital. Since net W/C includes inventory, and total assets includes inventory and PPE whose CC and HC could be significantly different, it is likely that this ratio would be more dimensionally sound²⁸ and hence would make more sense if computed using CC rather HC. This is particularly true if it is used for interfirm comparisons since CC gives rise to fewer artificial differences as discussed under the analysis of CR above.

(b) Activity (or Turnover) Ratios

(4) Sales/Total Assets (or Assets Turnover)

The assets turnover (ATO) ratio is intended to reflect the efficiency

²⁷ This is true of the information content of the ratio as well as intertemporal and interfirm comparisons.

²⁸ The concept of dimensional soundness is explained under the assets turnover ratio discussed below.

with which the assets are employed within the enterprise. Thus, it is a function of the efficiency with which management uses assets. Because it is a measurement of past management efficiency, it is thought to provide a reasonable basis for forecasting management's future efficiency. Such efficiency in asset utilization, of course, will be a prime determinant of the level of future flows accruing to the enterprise.

For the ATO ratio to present meaningful information, its computation must be dimensionally sound.²⁹ Dimensional soundness means that the units in which the numerator and denominator are stated be such that, after division, the quotient has an unequivocal and meaningful interpretation.³⁰ Such requirement should, of course, be met by any ratio in order for the result to have operational significance. This concept is introduced now, however, because the ATO ratio computed using HC data is not dimensionally sound. The fact that both the numerator and denominator are stated in dollars is not enough. The ratio is intended to portray the asset dollar value that was needed to generate a given dollar volume of revenues. For the result to have a defensible meaning, the values in the numerator must relate to the

²⁹For a further discussion of dimensional soundness, see Miller and Starr [1969, pp. 159-62].

³⁰This definition can be best understood by means of an example. Taking the simple Economic Order Quantity (EOQ) inventory model, if demand is known and spread evenly over the period, the EOQ (or Q*) is: $Q^* = \sqrt{\frac{2 DO}{c}}$

where: D= demand, in units, over a certain period of time.
O= ordering cost, in dollars, per order.
c= carrying cost, in dollars, per unit per period.

It is known that Q* is stated in units. To demonstrate the dimensional soundness of the formula, all independent variables will be put in dimensional terms as follows: D= Units/Time ; O= \$; c= \$/Units/Time
\$/Units/Timeing these dimensions into the formula yields:

$$\sqrt{\frac{2 \text{ Units} \times \$}{\text{Time} \times \$/\text{Units}/\text{Time}}} ; \text{Eliminating the pure number (2) and dividing gives:}$$

$$\sqrt{\frac{\$ \times \text{Units}}{\text{Time}} \times \frac{\text{Time}}{\$/\text{Units}}} = \sqrt{\frac{\$ \times \text{Units}}{\$/\text{Units}}} = \sqrt{\$ \times \text{Units} \times \frac{\text{Units}}{\$}} = \sqrt{(\text{Units})^2} = \text{Units.}$$

Thus, it can be observed that the EOQ formula is dimensionally sound since the dependent variable, Q*, is in units as it would be expected.

same general time period as those in the denominator. Valuing assets at their HC violates this requirement since the numerator is stated in values received over the most recent operating period whereas the denominator is stated in terms of costs that were incurred in a series of prior periods. In contrast, the asset turnover computed using CC is dimensionally sound.³¹

Intertemporal Comparisons

Intertemporal comparisons using CC turnover ratios make more sense than those using HC ATO ratios. This can be illustrated by means of an example. Consider a span of time over which there are increases in the prices of factors of production. In order to continue producing the same volume of output, an enterprise must now utilize more expensive inputs. If all other factors remain the same, these inputs (assets) must now generate higher revenues in order to maintain a constant ATO ratio. When input prices are rising, a profit maximizing firm should endeavor, at a minimum, to maintain its previous ATO ratio or, if possible, increase it. Valuing assets at their CC will indicate whether or not the firm is accomplishing this objective. If selling prices are at all sensitive to changes in input costs, HC ATO ratios will tend to rise as input prices rise, since the numerator, revenue flows, will adjust more rapidly than the denominator, asset stocks. This rising ATO can occur even when the 'real' turnover based on CC is constant or falling. Analyses based on such data (i.e., HC) can easily precipitate erroneous expectations regarding future returns and their validity.

Interfirm Comparisons

It has been pointed out earlier under the analysis of the CR that the

³¹Technically, the CC-ATO ratio is strictly dimensionally sound only if (1) the average level of assets employed in the denominator is valued at the average market value for the period, and (2) sales were spread evenly over the period. If these conditions are violated, the ratio is still not strictly dimensionally sound. However, Revsine [1973, p. 183] argues that except for very extreme violations, it can be said that the ratio has a high degree of dimensional soundness because of the virtual overlap of the periods in the

use of CC data reduces the number of arbitrary accounting techniques permitted in the preparation of external reports. This, in turn, increases the likelihood that firms with similar assets will tend to value these assets similarly. This will facilitate interfirm comparisons better than if HC data were used.

(5) Sales/Accounts Receivable (or Accounts Receivable Turnover)

If the Accounts Receivable Turnover (A/R T/O) is relatively high, say, 4 times or more a year, then, there is little, if any, enhancement to this ratio if it is computed using CC rather than HC. This is so since A/R will be expressed in dollars of the same operating period as sales, thus the problem of dimensional soundness does not arise. If, however, A/R T/O is low, say one or two times; the accounts themselves include some that are over due; and prices are increasing rapidly, then lack of dimensional soundness might be a problem. This is so since the numerator, 'Sales', will be expressed in dollars of lower purchasing power than that of the dollars reflected in the denominator, 'Accounts Receivable.' However, valuing A/R at CC or lower recoverable amount will not solve the lack of dimensional soundness problem in this case since A/R is a monetary item and the difference between its HC and CC amounts is usually not significant. Valuing A/R at HC/CD amount might alleviate that problem and hence improve intertemporal and interfirm comparisons.

(6) Sales/Inventory

Since, under the HC/ND basis, inventory can be valued using different cost flow assumptions, this ratio could have different values depending on which cost flow assumption is used. The use of LIFO, for example, would make the ratio not dimensionally sound since sales are expressed in current period dollars whereas inventory could be expressed in dollars of earlier period(s). numerator and denominator; and this would certainly be the case over comparable periods relative to the HC-ATO ratio.

Furthermore, the use of HC could give rise to artificial differences as explained under the discussion of the CR. On the other hand, the use of CC data in the computation of this ratio would lessen artificial differences and would make it more dimensionally sound and thus more meaningful and useful (particularly for intertemporal and interfirm comparisons) than if HC data are used in its computation.

(7) Sales/Working Capital

Since W/C is equal to CA less CL, most of the discussion of the CR applies to this ratio as well. However, there is an additional point which makes this ratio more theoretically valid if computed using CC rather HC. This point is that if the ratio is computed using CC it will be dimensionally sound since the numerator and denominator will be expressed in dollars of the same operating period.

(8) Sales/Net Worth

The net worth of a firm is its assets less its liabilities. Since assets include inventory and PPE, which are nonmonetary, there is likely to be a significant difference between net worth (NW) based on HC and NW based on CC. If the latter is used in the computation of this ratio, it (the ratio) will be dimensionally sound and hence its interpretation (i.e., how many sales dollars are generated by each \$1 of NW) will be more meaningful than if HC data were used in the computation.

Interfirm comparisons of this ratio should also make more sense because the use of CC will eliminate the artificial differences which may exist among firms using different accounting methods (even though the firms may be basically similar).

(c) Long-Term Solvency Ratios

(9) Times Interest Earned (TIE) Ratio

The TIE ratio provides, in the absence of yearly debt repayment requirements, a rough indicator of the ability of an enterprise to meet its debt service costs out of current earnings. This ability is jeopardized when the interest charge is high relative to earnings. In such situations, little margin exists to protect the firm should it experience a protracted business downturn. The ratio is often computed as follows (using current period data):

$$\frac{\text{Pre-tax Earnings} + \text{Interest Charges}}{\text{Interest Charges}}$$

Given the purpose of this ratio, it would seem that COP would be more appropriate in its numerator than total CC income. The intent of the ratio is to gauge the future ability of the firm to meet its existing interest obligations. Earnings of the current period are used only as a proxy for future operating flows. As a result, the earnings measure used should be a recurring one. Revsine [1973, p. 179] argues that total CC income would not serve this need because holding gains cannot necessarily be expected to recur and, indeed, may be reversed in future periods. Obviously, HC income would not serve this need either since it includes realized holding gains.

The solvency of a firm is highly dependent on the margin of safety, or spread, between net operating inflows and debt service (interest and principal repayments) outflows. When debt service outflows are constant while operating inflows decline, the firm's margin of safety diminishes. In this situation, a firm will be unable to maintain its pre-existing level of solvency at its pre-existing level of operations. One or the other, or perhaps both, must suffer. These possibilities increase the risk associated with future operating flows.

If HC income is used in the ratio, it is possible for the ratio to remain constant even though the 'real' margin of safety is declining. For

example, if inventory prices have quickly risen without corresponding increase in output prices, it is possible that HC income will not immediately fall. Thus, reported HC pre-tax income will be constant despite the fact that long-term profitability has been impaired. This means that using HC pre-tax income in the ratio will not show a decline in the margin of safety even though the real margin of safety has declined.

On the other hand, using COP (under the CC basis) in the ratio will reflect this real decrease in the margin of safety as the ratio will decrease.

Intertemporal Comparisons

For the purpose of intertemporal (trend) comparisons, CC-TIE (and its companion³²) will likely provide useful information. Changes in these ratios over the years will likely reflect movements in the real margin of safety. The corresponding HC ratios may not necessarily reflect such movements.

Interfirm Comparisons

Interfirm comparisons based on CC-TIE will probably make more sense than if the ratio is based on HC. Since the ratio will be computed using COP (rather than HC pre-tax income), and since COP represents the 'real' margin of safety, a firm with high total pre-tax income because of nonrecurring items or unstable holding gains, will not show erroneous high level of TIE ratio. Using HC pre-tax income might lead to such superficial high level of TIE ratios.

(10) Funds Flow from Operations/Debt Service [or FFO/(Interest + Principal Payment Requirements)]

This ratio reflects the ability of an enterprise to generate FFO to cover the current amount needed for debt service, i.e., actual interest charges and current maturities of debt. For the ratio to be meaningful, the

³²i.e., the ratio of operating income before interest and taxes to total debt service requirements (interest charges and principal repayments).

numerator must be the funds flow that is thought to be recurring and, hence, easily predictable in the future since the intent of the ratio is to gauge the future ability of an enterprise to generate FFO to cover debt service. As discussed earlier, COP may be used as a surrogate for funds flows available for distribution and expansion after maintaining the operating capability of the firm. Also, COP is thought, by its proponents, to be recurring and thus more predictable than total HC pre-tax income. Thus, using COP under the CC basis in computing this ratio is likely to enhance its meaning and its usefulness for intertemporal and interfirm comparisons.

(11) Net Worth/Total Debt (NW/TD)

This ratio (or its inverse, the familiar debt/equity ratio) portrays the capital structure of the firm. Industry differences notwithstanding, the higher (lower) this ratio, the stronger (weaker) the capital structure and the lower (higher) the perceived risk of the firm.

Computing this ratio using HC data may show (in periods of rising prices) a firm as riskier than it really is. This is so because, under HC, the ratio is not dimensionally sound. Rising prices lead to two results: (1) monetary items decrease in value, and (2) nonmonetary items increase in value. Since the numerator of the ratio, NW, includes nonmonetary items, and the denominator, TD, is all monetary, in periods of rising prices, the level of the ratio should rise to reflect the improved position of the firm. Using CC to compute the ratio accomplishes this whereas using HC does not.

Based on the above discussion, it can also be stated that intertemporal and interfirm comparisons of the ratio using CC data should be more meaningful to lenders than using HC data.

(12) Total Debt/Total Assets (TD/TA)

This ratio, like the NW/TD, is used as one of the factors determining

the degree of risk of a firm. Valuing assets at their HC may overestimate that degree of risk unnecessarily. Furthermore, comparing TD which is expressed in dollars of the current period to TA which is expressed in dollars of various prior periods (the HC computation) violates the dimensional soundness of the ratio. For these reasons, it seems likely that using SFAS 33 CC disclosures in computing this ratio should enhance its meaning and its usefulness for intertemporal and interfirm comparisons.

(d) Profitability Ratios

(13) Operating Profits as a Percentage of Sales

This ratio is intended to reflect the profit contribution percentage of each dollar of sales revenue. It has potential prognosticative utility insofar as management's ability to control past costs is a reasonable reflection of its ability to do so in the future. Because this ratio deals with operating performance and because it is intended to aid in assessing future performance, it seems appropriate to use, in the numerator, a profit concept that can theoretically be extrapolated. Thus, COP can be used for this purpose since holding gains reflect conditions that may or may not recur in future periods.

Using COP to compute the ratio is also likely to facilitate intertemporal and interfirm comparisons. Since cost expirations under CC are shown at the current value of the services consumed in generating revenues, the ratio is not distorted by price changes. Since price and efficiency changes can, and do, occur, examination of this ratio over time informs the reader of how those changes that did occur have affected the firm and how successful management has been in maintaining, or increasing, the percentage return on sales. The resultant trend may thus be useful as a basis for forecasting the variability of future flows from operations.

Theoretically, interfirm comparisons should be improved if CC data are

used to compute this ratio since there will be fewer choices of arbitrary accounting techniques. For example, using the HC basis may result in different cost of goods sold for two firms selling identical quantities of goods if one firm uses FIFO and the other uses LIFO. This difference should not occur under the CC basis.³³

(14) Net Operating Profits/Total Assets (or Return on Investment)

Since this ratio is equal to the ATO ratio times Profits as a Percentage of Sales, it is essentially a gauge of the overall operating efficiency of a firm. The return computed using CC data can be interpreted as that rate which would be earned from future operations if all prices and volume levels were to remain constant. Since the characteristics of this measure have been treated in the discussion of its two components above, there is little need for further analysis here.

The analysis of the above 14 ratios focused on whether each ratio would be more meaningful if computed using CC data rather than HC data. As indicated at the beginning of this section, if the meaning of a ratio used by commercial lenders is thought to be enhanced through the use of CC data in its calculation, these CC data are assumed to fit into the decision making model of commercial lenders. As shown in Exhibit IV-1 below, all of the 14 ratios (except the quick ratio) included in the framework of commercial lenders' decision making model developed in Chapter III, were found to theoretically fit into that decision making model.³⁴

³³ Of course, even under CC, two identical firms may have different cost of goods sold due to using different methods of determining CC. However, this difference in CC is not likely to be as significant as the difference between FIFO- and LIFO-based cost of goods sold. Johnson and Bell (1976) hold a similar view.

³⁴ Lucas (1981) explains why SFAS 33 data may enhance the meaning of other ratios and information such as price/earnings ratio, dividend payout, net assets & net assets per share, dividends per share, sales trend, and year-end stock prices. His explanation follows a line of reasoning similar to the one used in the analysis of the ratios discussed in this Chapter. These ratios were not discussed in detail here since most of them pertain more to investors' rather than to lenders' decisions.

Exhibit IV-1Should SFAS 33 Disclosures Fit Into the Decision Making Model of Lenders?

<u>A. Should the Following SFAS 33 Disclosures Help Achieve the Objectives or Enhance the Procedures of Commercial Lenders' Decision Making Model?:</u>		<u>Yes</u>	<u>No</u>
(a) Income from continuing operations on an HC/CD basis			x
(b) The purchasing power gain or loss on net monetary items	x		
(c) Income from continuing operations on a CC basis	x		
(d) CC amounts of inventory and PPE at fiscal year-end	x		
(e) Increases or decreases in CC of inventory & PPE during current year .	x		
(f) Five-year summary of selected financial data:			
1. Net sales and other operating revenues on an HC/CD basis	x		
2. Income from continuing operations on an HC/CD basis	x		
3. Income per common share on an HC/CD basis			x
4. Net assets (shareholders' equity) at fiscal year-end on an HC/CD basis	x		
5. Purchasing power gain on net monetary items	x		
6. Cash dividend per common share on an HC/CD basis			x
7. Market price per common share on an HC/CD basis			x
8. Income from continuing operations on a CC basis	x		
9. Income from continuing operations per common share on a CC basis .	x		
10. Net Assets at fiscal year-end on a CC basis	x		
11. Increases or decreases in CC of inventory & PPE, net of inflation.	x		
12. Average consumer price index for all urban consumers (CPI-U)			x
<u>B. Should the Following Ratios Become More Meaningful if Computed Using SFAS 33 Disclosures Rather Than HC Data?:</u>			
(a) Short-term Liquidity Ratios:			
1. Current ratio	x		
2. Quick (Acid-test) ratio			x
3. Working Capital/Total Assets	x		
(b) Activity (or Turnover) Ratios:			
4. Sales/Total Assets (or Asset Turnover).....	x		
5. Sales/Accounts Receivable (or A/R T/O)	May be*		
6. Sales/Inventory	x		
7. Sales/Working Capital	x		
8. Sales/Net Worth	x		
(c) Long-term Solvency Ratios:			
9. Times Interest Earned ratio	x		
10. Funds Flow from Operations/Debt Service	x		
11. Net Worth/Total Debt	x		
12. Total Debt/Total Assets	x		
(d) Profitability Ratios:			
13. Operating Profits as a Percentage of Sales	x		
14. Net Operating Profits/Total Assets	x		

* See discussion in the text of the chapter.

To summarize this section, Exhibit IV-1 presents an outline of what aspects of SFAS 33 data fit into the decision making model of commercial lenders.

The following chapter presents the research design, variables and hypotheses related to empirically testing whether SFAS 33 data affect lending decisions.

CHAPTER V
RESEARCH DESIGN, VARIABLES & HYPOTHESES

A. The Research Design

In designing a research project, the research designer usually makes certain choices and judgments regarding the various aspects of the project. In this study, certain choices and judgments are made with respect to the following components of the research: (a) a decision situation, (b) a decision maker who is oriented towards that decision situation, (c) levels of financial information which are directly related to the nature of the decision, (d) a firm whose financial data are to be used as a basis for the decision, and (e) research methods to be used in gathering data from the decision makers. The research components and choices are summarized in Exhibit V-1 below and the rationale behind these choices is discussed in the following sections.

Exhibit V-1
Research Components and Choices

Component	Choice
(a) Decision Situation	The business loan made by commercial banks
(b) Decision Makers	Commercial bank lending officers (BLOs)
(c) Information Levels	Four levels of financial information will be used: Historical Cost financial statements (HC); HC plus Constant Dollar data (CD); HC plus Current Cost data (CC); and HC+CD+CC.
(d) Firm to be used	A real firm will be used; one that is most adversely affected by SFAS 33 disclosures
(e) Research Methods	Mail questionnaire and interviews

(a) The Business Loan Decision Situation:

The business loan granted by commercial banks is analyzed because it is a decision situation where the role of accounting information is vital (Abdel-Khalik, 1973; Stephens, 1978; and Deitrick and Stamps, 1981). There are two

main factors which affect the evaluation of commercial loan applications; the ability to pay and the willingness to honor the terms of the contract. The factors measuring the willingness to pay are assumed to have been investigated to the satisfaction of the lending officers, thus allowing them to focus their attention on the ability to pay.

As discussed in Chapter III, there are other factors influencing the loan decision including: (a) the length of maturity, (b) the purpose of the loan, (c) the payout schedule, (d) the prospects of long-term banking relationship, (e) the short run and immediate deposit relationship, and (f) the interest rate charged. Factors (a) and (b) are provided in the questionnaire, factors (c), (d) and (e) are listed in the research assumptions in the questionnaire, and factor (f) is left to the respondent to determine (as an increment above the prime rate) based on his evaluation of the financial statements of the company and its degree of risk.

The bank lending officers (BLOs) are asked to evaluate an application by the firm for a \$15 million unsecured commercial loan. These characteristics of the loan are chosen so that BLOs focus specifically on the accounting information in making their decisions. Based on interviews with BLOs, Stephens (1978) found that \$50,000 was considered a loan of sufficient size to require financial statement analysis. Abdel-Khalik (1973) used a \$1 million loan but the companies he selected were smaller, in terms of total assets, than companies subject to SFAS 33. In view of the size of the firm to be used in this study, a loan of even \$1 million would almost always be approved by all BLOs regardless of SFAS 33 disclosures. Hence, a \$15 million loan is used. It is not too small to require financial statement analysis or to render the effects of SFAS 33 negligible and

it is not too large to require the recommendation of a committee rather than that of an individual BLO. Nevertheless, BLOs are given the choice of recommending less than the required amount or even zero if they so desire. The unsecured nature of the loan is selected to remove confounding effects of collateral evaluation from the loan decision. The commercial type of the loan is selected since only companies, but not individuals, are subject to SFAS 33 requirements.

(b) The Decision Makers (Bank Lending Officers):

Bank lending officers have been chosen as subjects in this study because they: (1) rely on accounting data in decision making (Robert Morris Associates, 1964; Hodgman, 1968; Abdel-Khalik, 1973; Oliver, 1974; Libby, 1974; Kennedy, 1975; Herrick, 1978; Stephens, 1978; Casey, 1980; and Deitrick & Stamps, 1981), (2) analyze financial statements with considerably greater sophistication than other large user groups (Stephens, 1978, and Casey, 1980), (3) play an influential role in economic resource allocation (Casey, 1980), (4) have been used as subjects in other studies [Oliver (1972), Abdel-Khalik (1973), Libby (1974), Kennedy (1975), Stephens (1978), Diamond and Arnold (1979), Casey (1980), and Deitrick & Stamps (1981) among others], and (5) most importantly, they make commercial loan decisions as final (and not surrogate for final) decision makers.

To provide motivation for BLOs to respond, they were given the opportunity to elect whether or not to receive a copy of the results of the research. Also, the covering letter from the Chairman of the Dissertation Committee asked for BLOs' cooperation on the project for its importance to the dissertation and its immediate practical value to banking in general and to BLOs in particular. Furthermore, the covering letter from this

researcher was addressed to each individual subject by name and title and was hand (and not machine) signed personally by the researcher. [See Appendix A for copies of the two covering letters as well as the second request which was also individually addressed and signed by the researcher]

(c) Levels of Financial Information:

Four levels of financial information are chosen: HC financial statements only; HC + CD information; HC + CC information; and HC + CD + CC. All levels include the HC basis because the FASB considers it the primary basis for financial reporting. Another reason for choosing these four levels is that the basic objective of the research is to determine the effects of SFAS 33 which did not allow reporting CD or CC data without the HC financial statements. However, the research design allows a determination of which supplementary information (CD, CC, or both) is desirable, if at all, for the decision making process of lenders.

Including supplementary "soft" information (i.e., management's projections) beside the financial statements and the notes thereto in the questionnaire package was not made for the following reasons:

1. There is no consensus as to what supplementary information may be added.
2. Previous researchers using similar designs (e.g., Dyckman, 1969; Abdel-Khalik, 1973; Heintz, 1973; McIntyre, 1973; Libby, 1975; and Casey, 1980) did not add any management projections.

The use of different information levels by different groups of decision makers to measure the effect of the variation in these levels on the decisions made by those groups has been done in the past. [See, for example,

Barefield (1972), Abdel-Khalik (1973), and Casey (1980) among others]. In this study, BLOs are classified into 7 groups. Each group will receive a specific level of financial information as discussed later on. For the purpose of allowing BLOs to make trend analysis, all groups will also receive the financial statements (without the notes) for the preceding two years.¹

(d) The Firm:

Previous researchers who investigated the effects of General Price Level Adjusted (GPLA) or CC financial statements on investments decisions have chosen one of two routes in selecting the firms whose financial data are to be studied. Dyckman (1969) used hypothetical firms. Heintz (1973) and McIntyre (1973) used actual very large firms. Because these researchers had to restate the HC statements to derive GPLA or CC statements, they expressed the importance of using firms with varying investments in long-lived assets so that the adjusted statements would be significantly different from the HC statements.

None of the above approaches seemed suitable for the purpose of this study. Fictional firms are not appropriate since it is always possible to construct firms in such a way as to bias the results toward any specific conclusions desired. Very large firms are not used because that size may

¹Even though some BLOs may prefer 5-year data, only 3-year data are used to conserve the time required for data analysis by BLOs. RMA considers 3 years to be an acceptable minimum requirement for trend analysis. Furthermore, previous researchers [e.g., Abdel-Khalik (1973) and Casey (1980)] used only 3 years.

mask the fine distinctions that might be brought about by the disclosures of inflation effects in accordance with SFAS 33. Hence, an actual medium-size company (Raybestos-Manhattan, Inc.) is chosen.² In this study there is no need to restate HC statements since CD and CC data are reported by management.

Criteria for Selecting the Company Used in the Study

In choosing a firm³ for this study the following 7 criteria were used:

1. The company is subject to the requirements of SFAS 33.
2. The company's annual report is available at the SEC library.
3. The sum of the company's inventory plus gross property, plant & equipment (PPE) does not exceed \$200 million.
4. The company's fiscal year-end is December 31st.
5. The company discloses both CD and CC information.
6. The company is not one of the following industry groups: forest products; mining; oil and gas; and real estate.
7. The company is not a financial company, i.e., insurance, banking, or

²Raybestos-Manhattan, Inc., headquartered in Trumbull, Connecticut, is a multinational manufacturer and marketer of energy absorption and transmission products, fastening systems and custom-engineered materials. It has been listed on the New York Stock Exchange since 1929.

³Previous researchers [e.g., Dyckman (1969), Abdel-Khalik (1973), Heintz (1973), McIntyre (1973), Libby (1975), and Casey (1980)] used at least 2 companies to test for the effect of the variation in accounting information on decisions. It was originally planned to use two companies in this study as well. However, as a result of pretesting the questionnaire (in a pilot study) with 2 companies, the average time taken by BLOs to analyze the data and answer the questions was found to be too long (1 hour and 25 minutes). It was felt that this relatively long time will drastically reduce the response rate expected. Consequently, it was decided to drop one company. It should be noted, however, that the sample of BLOs was completely randomized with no restriction. Complete randomization should make the difference among the decision models of the 7 groups not significantly different from zero.

other types of financial institutions.

The reasons for the first and second criteria are self explanatory. The reason for the third criterion is two-fold: First, only one company is to be selected out of about 1,200 companies subject to SFAS 33. Unless some limitation is outlined, that selection process would be immense. It was felt that an upper limit of \$200 million in inventory and gross PPE is reasonable enough to reduce the pool from which the company is to be selected to a manageable size. Second, this upper limit is suggested because, as discussed earlier, a company with higher amounts for inventory and gross PPE would be so large in size that a \$15 million loan might be so trivial that BLOs might approve the loan regardless of the disclosures under SFAS 33. And increasing the size of the loan above \$15 million may lead to either one or both of the following: (1) the loan amount may be greater than the lending limit of most banks, and (2) the loan may need a committee, rather than an individual, decision. Neither of these results is desirable for the purpose of this research.

The reason for the fourth criterion is that SFAS 33 is applicable to qualifying companies whose annual reports are issued after 12/15/1979. Companies with fiscal year ending after that date did not have their annual reports at the library mentioned above at the time of selecting the company (June 1980). Furthermore, most companies have a December 31st fiscal year end. The reason for the fifth criterion is that both CD and CC information are required for the research design. The objective of this study is to determine the effects of SFAS 33 as a whole, and not only CD information, on lending decisions. The reason for the sixth criterion is that SFAS 33 applies only partially (CD disclosures only) to these industry

groups [SFAS 33, Para. 19]. The reason for the seventh criterion is that these financial companies do not have significant amounts of inventory and PPE and therefore SFAS 33 is not expected to have any significant effects on these companies.

After applying the above 7-point criteria for selecting the firm to all companies subject to SFAS 33, a total of 40 firms met the criteria as shown in Table V-1.

Table V-1
Companies Meeting the Selection Criteria

Companies Listed On →	NYSE	ASE	TOTAL
Companies listed as of 12/31/1979	1,565	934	2,499
Companies not subject to SFAS 33	<u>455</u>	<u>857</u>	<u>1,312</u>
Companies subject to SFAS 33	<u>1,110</u>	<u>77</u>	<u>1,187</u>
<u>Less:</u>			
Companies with inventory and gross property, plant & equipment exceeding \$200 million or not required to disclose CC data	820	25	845
Financial companies	110	5	115
Companies with a non-12/31 fiscal year-end	76	24	100
Companies disclosing only CD data	42	4	46
Companies not complying with SFAS 33	22	6	28
Companies whose annual reports are not available at the SEC library	<u>7</u>	<u>6</u>	<u>13</u>
Companies not meeting the selection criteria	<u>1,077</u>	<u>70</u>	<u>1,147</u>
Companies meeting the selection criteria	<u><u>33</u></u>	<u><u>7</u></u>	<u><u>40</u></u>

NYSE: New York Stock Exchange

ASE : American Stock Exchange

The ratio of CC income to HC income (both from continuing operations) was computed for each of those 40 companies. These ratios were then ranked in a descending order with the highest at the top and the lowest at the

bottom. The ranked list was then divided into 4 quartiles in which the first and the fourth represented the least adversely affected companies (LAACs) and most adversely affected companies (MAACs) respectively.

This classification of companies into LAACs and MAACs (rather than into capital-intensive and labor-intensive) has much theoretical appeal. On an a priori basis, it can be postulated that the magnitude of the impact of SFAS 33 disclosures on reported income from continuing operations does not depend merely on the capital-intensity of the firm but on other factors as well, namely: (1) the age distribution of its assets, (2) the depreciation method followed, (3) the method of inventory valuation (e.g., FIFO vs LIFO), (4) the rate of inventory turnover, and (5) the rate of specific price changes of the items involved.⁴ This may explain the fact (found during work on companies' selection) that even among capital-intensive firms, SFAS 33 may have significantly different effects on reported income. In such cases, the age distribution of the firm's assets may be indicative of the technological dynamism of the firm and the newness of its assets whose HC and CC may be more or less comparable. With such firms, therefore, the HC depreciation and the CC depreciation expense may be very close, as opposed to other capital-intensive firms which may not be as dynamic in terms of their technological developments. A good example in this regard is a comparison of NCR, Inc., a firm with rapidly developing technology, versus Phoenix Steel, Inc., a company with no such attribute. Reference to their disclosures of the effects of inflation in accordance with SFAS 33 in their 1979 annual reports shows that whereas Phoenix Steel's CC depreciation expense is 300% higher than its

⁴For a brief discussion of this subject see Sharpe [1978, pp. 178-80].

HC figure, that of NCR's is even 15.5% lower than HC depreciation.⁵

One MAAC was randomly selected from the fourth quartile as explained above.

(e) Research Methods:

The basic tool of this empirical part of the study is a questionnaire in which a decision situation is constructed and BLOs are asked to use the data provided with the questionnaire in making two basic types of decisions: One involves the allocation of scarce loanable funds to the firm or keeping the funds available for other potential borrowers with a better credit risk. To test for the effect of SFAS 33 on the short-term as well as long-term ability of the firm to pay, two different maturities of the loan are requested. The second type of decision is concerned with the subjective estimate (but of course based on the data provided) of the probability of default. One estimate is requested for each loan.

In order to check on the degree of consistency of loan officers in making one of the above probability estimates of default, they are asked to estimate the probability that the firm will be a good credit risk during the 3 years following the loan application. For example, if a BLO's estimate of the probability that the firm will default on a given loan is, let us say, p , then, if he is consistent, his estimate of the probability that the firm will be a good credit risk should be equal to $1-p$ or, let us say, q . The extent of consistency will be measured by the closeness of the

⁵ Similar comparisons between Honeywell, Inc., again a company with rapidly developing technology, and the "Big Three" auto makers in terms of Replacement Cost (RC) disclosures under ASR 190 back in 1977, showed that Honeywell's RC depreciation was only 3% higher than HC depreciation whereas the auto makers' RC depreciation was 70% higher than HC depreciation. This fact has been reported as evidence suggesting that RC disclosures can after all reveal facts that may not otherwise be obvious from the HC statements. See Pappas [1977, p. 1 & 6].

estimates given by BLOs for the attractiveness of credit risk to the scores of q . This measure of consistency may be used to evaluate the effects of information levels on the congruency of subject judgments.

Although the purpose of this part of the study is to gain some insight into the effects that SFAS 33 may have on the BLOs' decisions, there are other variables related to the variation in the individual's information processing ability which may also have decision effects. While the level of information is considered a "task variable," these other variables are called "decision maker's variables."⁶ One might wonder, for example, whether there is a relationship between a BLO's risk taking attitude and his decisions, and whether his knowledge and experience (reflected possibly by the time consumed in processing credit information⁷) influence his decisions.

These subjects' variables were considered important by previous researchers. [See Abdel-Khalik (1973), Libby (1975), and Casey (1980)]. Therefore, in the questionnaire, BLOs are asked to write down the amount of time they spent in assimilating accounting information provided to them and in making their decisions. They are also asked to indicate their experience in terms of commercial loan applications they processed in the past. With respect to this experience question, it is not possible to ask it directly. According to experts in questionnaire design [Payne (1951) and

⁶ Abdel-Khalik (1973) tested for differences in subjects' experience and risk attitude even though he used a random sample. Casey (1980) tested for differences in subjects' experience, time spent on data analysis, and ability of BLOs to process loan applications. He especially tested for this last variable because his sample was not randomly selected.

Even though the sample in this study is randomly selected, tests for differences in subjects' experience and risk attitude will be made to make sure there are no significant differences among the groups with respect to these important subjects' variables.

⁷ That is, the more knowledgeable and experienced the BLO, the less time he is likely to take in processing credit information.

Oppenheim (1966)], one of the characteristics of a "bad" question is to ask the respondent about something he may not remember. It is not easy for a BLO to remember how many commercial loan applications he processed in the past. Therefore, to make it easy for BLOs to answer this question, two questions are asked to determine the number of loans evaluated, the answer to each can be easily remembered. One is about the number of years the BLO was engaged in evaluating commercial loans and the other is about the number of loans evaluated in a "typical" week.

The time spent in evaluating the data and the past experience are two variables that are thought to have a bearing on BLOs' decisions, especially if the time spent in evaluating applications could be considered a surrogate for the cost of processing data and if such a cost varies with experience.

In relation to subjects' risk attitude, it is not reliable to ask a subject whether or not he is risk averse and the extent of his aversion. Such a direct question might elicit a defensive or otherwise biased answer, depending on the subject's perception of the importance of such a measure. Furthermore, the degree of an individual's risk aversion might be situation specific, e.g., a person may be more risk averse in handling other people's resources as compared to his own. For the purpose of this study, the important risk dimension is the BLO's risk attitude toward the investment of the bank's resources in commercial loans. As a substitute for the direct approach, the question asked is: "In your judgment, which of the following ranges would you consider to include an acceptable annual average percentage of dollar losses on total commercial loans?". The subjects are asked to choose one of six ranges that go from 0% to over 2.5%. Presumably, the higher the range, the lower the risk aversion of the subject and vice-versa.

At this point, a summary of the research variable is appropriate.

B. The Research Variables

The research variables are classified as task variables, subjects' or decision makers' variables, and the interaction variable as listed below:

Task Variables:

1. A recommendation of a loan for six months.
2. The increment above the prime interest rate at which the 6-month loan is recommended.
3. An estimate of the probability of default on the 6-month loan.
4. An estimate of the probability that the firm will be a good credit risk during the next three years.
5. A recommendation of a loan for a three-year term.⁸
6. The increment above the prime rate at which the 3-year loan is recommended.
7. An estimate of the probability of default on the 3-year loan.

Subjects' Variables:

8. The subject's risk attitude as measured by the extent he is willing to tolerate losses on commercial loans.
9. The subject's experience in terms of number of loans evaluated in the past.
10. The subject's title and position at the bank.

⁸Three years were chosen because this is the length of time over which a bank can assess the potential profitability of a new customer relationship over an entire credit cycle (the expected time between periods of tight money). It is relatively difficult, however, for a BLO to make projections for more than three years. In addition, the maximum term loan maturity for most banks is 5 years. Thus, a 3-year loan is just about the average for most loans. (Cohen and Hammer, 1966). Furthermore, previous researchers [e.g., Abdel-Khalik (1973), and Casey (1980)] used 3 years.

11. The subject's membership (or lack thereof) in a professional banking association.
12. The subject's bank size as measured by total deposits as of the bank's latest fiscal year-end.
13. The activity index of the subject's bank as measured by the ratio of total loans to total deposits as of the bank's latest fiscal year-end.

Task and Decision Maker Interaction Variable:

14. Time spent on data analysis and answering the questionnaire.

It should be noted that the most important variables are the first nine listed above. The title or position of loan officers in a bank is a rather poor attribute for statistical analysis, since (a) qualification and qualities of same title holders may vary among banks depending on the size of the bank, and (b) in almost every bank's hierarchy, higher titles appear plentiful so that customers may have more confidence in dealing with a vice president or an assistant vice president instead of a lower rank. The variables related to the bank size and its activity index are not asked for in the questionnaire since they are easily obtainable from the library. These subjects' variables concerning bank size, activity index, title and membership in professional banking associations will be used mainly for classification.

At this point, a summary of the basic idea of the research design seems in order. It is presented below.

Basic Idea of the Research Design:

As discussed earlier, one real firm (a MAAC) has been selected from the forty companies meeting the selection criteria [See Table V-1]. The inflation effects disclosures in the financial statements of the firm are

Exhibit V-2
The Basic Design

CONTROL GROUP	← GROUP TYPE →		TREATMENT GROUPS		
	← INFORMATION LEVEL → (Number and Content)		2	3	4
	HC Only		HC + CD	HC + CC	HC + CD + CC
Group 1	Mode of Inflation Presentation	Inflation Effects Are shown only in the notes to the financial state- ments	Group 2	Group 3	Group 4
		Inflation effects are shown on the face of the Income Statement and the notes to the financial statements	Group 5	Group 6	Group 7

Notes:

HC : Historical Cost Financial Statements.

CD : Constant Dollar Supplementary Information.

CC : Current Cost Supplemntary Information.

presented in two modes: (1) they are shown only in the notes to the financial statements, and (2) they are shown on the face of the Income Statement as well as in the notes to the financial statements. These two modes of inflation presentation are partitioned under 3 different information levels: HC + CD; HC + CC; and HC + CD + CC; resulting in 6 treatment groups. In addition to these 6 groups there is, of course, the control group which will receive an information level containing no inflation effects, (i.e., it will contain only HC data). Each of the 6 treatment groups will receive an information level intersecting with an inflation presentation mode as shown in Exhibit V-2.

C. The Questionnaire: Additional Information:

All the research variables and assumptions are covered in the questionnaire presented separately in Appendix A. It should be noted that every question has been checked against a check list of 100 considerations to be taken into account when designing "good" questions as given in Payne's (1951) The Art of Asking Questions, a book devoted entirely to question wording. Also, the questions have been tested by a sample of BLOs in the New York Metropolitan area and modified to meet their suggestions. Furthermore, every word in the questionnaire, with minor exceptions, is included among the 1,000 most familiar and frequently used words in the English language, again as reported in Payne (1951). All exceptions are very familiar to and used most frequently by (in fact, they are household words such as "commercial loans," "credit risk," "probability of default," etc., for) bank loan officers, the subjects of this investigation.

In addition to the research variables and assumptions needed to test the basic hypotheses of this study, the questionnaire includes other questions the answers to which are of interest and important in their own right. These questions and their justifications are presented below.

1. Regarding all your decisions above, what are the most important factors or pieces of information you have considered in making those decisions? (A space of five lines is provided for the answers). Even though the answer to this question is important in its own right, one purpose of this question is to find out whether BLOs consider the disclosure of inflation effects an important factor when making their decisions.
2. What additional information would you have liked to have in this set of financial reports which are not presently here? (A Space of five lines

is provided). Again the answer to this question is important in its own right, but one basic purpose of it is to determine whether BLOs receiving exclusively HC data would list the disclosures of inflation effects as one of additional kinds of information they would have liked to have in order to make better decisions.

3. The financial statements of the company included various supplementary notes. How much did each of these notes help you in making your decisions?. BLOs are asked to circle one out of five numbers for each note where number 1 means that the note was not helpful and number 5 means that the note was very helpful. The basic purpose of this question is to determine whether BLOs consider the note on inflation effects to be helpful to them in making their decisions and the degree to which it is helpful. All other notes are listed in the question so that the main focus of the question may be hidden in order to avoid any possible biases.

4. Are you a member of a professional banking association?

[] No. [] Yes. Please indicate which _____.

This is a part of a question concerning loan officers' background. The purpose of this part is to be able to make a comparison of the known population demographic characteristics and the sample characteristics in an effort to determine the significance of non-response bias.

Two widely accepted methods for determining the existence or nonexistence of non-response bias are found in the marketing literature. These approaches involve: (1) a comparison of sample characteristics to known population characteristics, and (2) a comparison of the responses of early and late respondents.⁹ These two methods will be used in this study. There are

⁹These two procedures are also advocated by accounting researchers. See, for example, Dyckman, Gibbins, and Swieringa in Abdel-Khalik & Keller [1978].

three known characteristics of the population of loan officers: (a) geographic location, (b) sex, and (c) percentage of officers who are members of a professional banking association. The first two characteristics are also known about the sample. The purpose of this question is to determine the third characteristics about the sample.

D. Research Hypotheses

Hypotheses' Development, Rationale, and Tests to be Used:

Main Hypotheses:

The main hypotheses to be tested in this research study are directed at finding answers to a set of questions related to the disclosures of inflation effects in accordance with SFAS 33. The questions of interest are: Does the disclosure of inflation effects lead BLOs to reach decisions different from those reached without the disclosure? Does reporting the inflation effects on the face of the income statement (I/S) lead to decisions different from those based on disclosing inflation effects only in the notes to the financial statements? and finally, would the type of inflation effects reported (i.e., CD information only, CC information only, or both) lead to different decisions?

In this section, three main hypotheses are developed in attempt to provide answers to the aforementioned questions. The rationale for each hypothesis and the basic statistical test(s) to be used are also discussed in this section.

The means of each of the 7 task variables of the study (see page 136) will be used as the dependent variables for the purpose of testing the hypotheses. The main hypotheses are developed below.

1. The first hypothesis is that lending decisions made by BLOs using SFAS 33 disclosures will be different from those made by BLOs using HC data

only. The rationale for this hypothesis is based on the argument that these disclosures will help decision makers (BLOs in this case) assess the enterprise's cash flows, operating performance, maintenance of operating capability, and maintenance of general purchasing power as discussed in detail in Chapter IV.

The null hypothesis may be formulated as follows:

$H0_1$: There are no significant differences between lending decisions made using SFAS 33 disclosures and those made using HC data only.

The alternate hypothesis may be stated as follows:

$H1_1$: There are significant differences between lending decisions made using SFAS 33 disclosures and those made using HC data only.

This hypothesis will be tested through making multiple comparisons between the mean of each task variable under each of the inflation effects information levels (CD, CC, and both) and each mode of inflation presentation (in notes only, and in notes + I/S) and the HC information level. These multiple comparisons will be made using student t-tests.

This hypothesis will also be tested using one-way ANOVA to determine whether there is a significant difference between the mean of each task variable across the 4 information levels taken as a whole and not two by two as under the t test. Because the student t and ANOVA tests assume that the observations of each variable are normally distributed, the Kolmogorov-Smirnov goodness of fit test of normality will be used to determine whether the normality assumption holds. If it doesn't, the non-parametric Mann-Whitney U test will also be used to test the above hypothesis.

2. The second main hypothesis of the study is that the mode of inflation presentation (i.e., whether inflation effects are disclosed only in the notes to the financial statements or are also presented on the face of the I/S) will lead to different lending decisions. The rationale for

this hypothesis is based on the results obtained by Casey (1980) showing that adding the notes to the I/S and Balance sheet (B/S) did not improve BLOs' prediction of bankruptcy even though it consumed more time. Even though some reservations may be made regarding Casey's methodologies and data sets, it is thought that BLOs may not thoroughly examine the notes to the financial statements and concentrate instead on the I/S and B/S. Thus, it is felt that the group of BLOs receiving the data sets with inflation effects shown on the I/S may reach decisions different from those reached by the groups receiving data sets with inflation effects shown only in the notes to the financial statements.¹⁰

The null hypothesis may be formulated as follows:

H_0 : There are no significant differences between lending decisions made based on data sets with inflation effects disclosures presented only in the notes to the financial statements and those made based on data sets with inflation effects shown also on the face of the I/S.

The alternate hypothesis may be stated as follows:

H_1 : There are significant differences between lending decisions made based on data sets with inflation effects disclosures presented only in the notes to the financial statements and those made based on data sets with inflation effects shown also on the face of the I/S.

This hypothesis will be tested using student t and Mann-Whitney U tests.

3. The third main hypothesis is that the type of inflation effects disclosed (i.e., CD, CC, or both) will lead to different lending decisions. The rationale for this hypothesis is based on the argument that each type of

¹⁰ It should be noted, however, that this expectation is not a strong one. It is based only on the possibility that the groups receiving inflation effects only in the notes may not read them at all and, thus, their decisions could not be affected. However, if there is an indication that the note on inflation effects has been read (e.g., the time spent by treatment groups in data analysis is longer than that spent by the control group), then there is no ground to expect that the mode of SFAS 33 data presentation will affect lending decisions.

inflation effects may help in assessing only one aspect of the enterprise. For example, CD information may help in assessing only the degree to which an enterprise has maintained the purchasing power of its financial capital, while CC information may help in assessing only the degree to which an enterprise has maintained its operating capability. Obviously, providing both types of inflation effects may help in assessing both aspects.

The null hypothesis may be formulated as follows:

H_0_3 : There are no significant differences between lending decisions made using different information levels containing different types of inflation effects disclosures, i.e., CD, CC, or both.

The alternate hypothesis may be stated as follows:

H_1_3 : There are significant differences between lending decisions made using different information levels containing different types of inflation effects disclosures, i.e., CD, CC or both.

This hypothesis will be tested using one-way ANOVA, t and U tests.

4. One other hypothesis may be tested even though it does not relate to task variables (i.e., lending decisions). This hypothesis relates instead to the time spent on data analysis and answering the questionnaire. The time spent by BLOs in analyzing the data and making decisions is a function of the interaction between task variables (representing the lending decision situation) and subject variables (representing the personal attributes of the decision maker). The question of interest here is this: does the level of information have a significant effect on this time element? That is, would groups receiving SFAS 33 data take significantly more time (in analyzing the data and making decisions) than the time taken by the group not receiving SFAS 33 data (i.e., the control group)? The answer to this question is important for two reasons: (1) the time spent may be used as an indication of whether or not subjects

have analyzed SFAS 33 data in the process of making their decisions, and (2) it may be used as a surrogate for the cost of processing loan applications. If loan officers receiving SFAS 33 disclosures took significantly more time than that taken by the control group, this may be an indication that the groups receiving SFAS 33 data have analyzed those data in the process of making their decisions, and vice versa. As to using the time taken in analyzing the data as a surrogate for the cost of evaluating loan application, this is not an unrealistic assumption since this time is, indeed, a major element of that cost.

The null hypothesis and its alternate may be formulated as follows:

$H0_4$: There is no significant difference between the time taken, in analyzing the data and answering the questionnaire, by the treatment groups and that taken by the control group.

$H1_4$: There is a significant difference between the time taken by the treatment groups and that taken by the control group.

This hypothesis will be tested using one-way ANOVA, student t and Mann-Whitney U tests.

Ancillary Hypotheses:

Before the above mentioned main hypotheses are tested, some ancillary hypotheses need to be tested. The purpose of these hypotheses is (1) to ascertain the absence of significant differences among respondent groups of BLOs with respect to their personal attributes, particularly their risk attitude and experience, and (2) to determine whether there is a dependent relationship between the mode of inflation presentation (i.e., in notes only or in notes and I/S) and the level of information (i.e., CD, CC, or both).

These ancillary hypotheses and their alternates may be formulated as follows:

A- $H0_1$: There is no significant difference among groups assigned to different information levels with respect to risk attitude and experience.

A-H1₁ : There is a significant difference among groups assigned to different information levels with respect to risk attitude and experience.

This hypothesis will be tested using t and U tests.

A-H0₂ : There is no interaction effect between the mode of SFAS 33 data presentation and the level of information.

A-H1₂ : There is an interaction effect between the mode of SFAS 33 data presentation and the level of information.

This hypothesis will be tested using one-way ANOVA.

There is no logical rationale for the alternate ancillary hypotheses above, hence it is expected that the null hypotheses will not be rejected.

Other minor hypotheses will be tested and other statistical models will be used including simple, partial, and canonical correlations, and canonical discriminant analysis. The statistical statements and detailed testing methodologies of all hypotheses are presented in Chapter VI.

E. Additional Insights: Which Level of Information is Preferable?

In addition to the basic objective of this empirical part of the study, i.e., whether or not SFAS 33 disclosures seem to have any effects on lending decisions, the research design allows an attempt to be made to determine the desirability of certain SFAS 33 disclosure requirements in terms of improving lending decisions. Unfortunately, there is no generally accepted set of criteria of what constitutes an "ideal" level of financial information for decision making. Nevertheless, a set of criteria for what constitutes a "preferable" decision, and consequently what constitutes a "preferable" level of financial information over other levels has been postulated and used in previous research [see Abdel-Khalik (1973) and Diamond and Arnold (1979)] and will be used in this study. This set of criteria is discussed below.

A Set of Criteria:

It may be recalled that BLOs are asked to make several subjective estimates (based on the financial statements and notes provided to them) of the probability that the borrowing firm will default on (a) a 6-month loan, and (b) a 3-year loan. Furthermore, the same decision makers are also asked to estimate the probability that the firm will be a good credit risk during the next 3 years. Using these estimates along with the criteria for the measurement of the "preferability" of decisions, a rank ordering of the information levels may be obtained. The preferability criteria include two elements: (1) the degree of consensus among decision makers, and (2) the consistency of decisions made by decision makers. Following is a discussion of these elements.

(1) Degree of Consensus:

For each mode of inflation presentation and each loan, measures of dispersion of the amount of loan recommended, the increment above the prime rate charged, and the probability estimates made at each information level will provide one such measure of preferability. The intuitive appeal of this measure can be explained as follows: If one can imagine a level of accounting information that is "best" for decision making, i.e., a level that has neither more nor less than the "exact" amount of accounting information required for making a "perfect" or an "ideal" decision, and assuming that BLOs have certain decision making models which, even though not explicitly and precisely known, are more or less the same (especially as far as the use of accounting information is concerned), one would expect that the amount of loan recommended, the interest rate charged, or the probability estimate made by various decision makers for a given firm would be almost

identical (given that all non-financial information is considered constant). Now, realizing that such "best" level of information does not exist, since it cannot even be defined, then the "second best" level of information would be the one at which the amount of loan recommended, the interest rate charged, or the probability estimate made by various decision makers for a given firm are very close, i.e., have the smallest dispersion. Leaving the intuitive appeal aside, statisticians define the most efficient estimate as the one having the smallest variance.¹¹

Thus, the degree of consensus of loan officers will be compared for each mode of inflation presentation and each loan across various levels of information. The information level that is conducive to the highest degree of consensus among decision makers, i.e., the level that produces the lowest variance, may be regarded as the level that is most preferable, given that the degree of consensus is accepted as a measure of preferability. The testing for the homogeneity of variance across levels of information will be made using various statistical models as explained in detail in Chapter VI.

(2) Consistency of Decision Makers:

Another possible measure of the preferability of decisions, and consequently of information levels, is the consistency of decision makers in making their decisions. Again, the level of information which provides the highest degree of consistency may be regarded as the level that produces a preferable decision, given the acceptance of the consistency criterion. There are two possible ways of assessing the consistency of BLOs

¹¹ For criteria of good estimators see, for example, Frank [1971, pp. 166-70].

in making their decisions:

(a) One measure is the consistency between the given estimate of the probability of default and the amount of loan recommended or the increment above the prime rate charged for the same firm by the same officer. This may be determined by correlating the estimate of default and the amount of loan recommended, and the estimate of default and the interest rate charged for each loan at each level of information. Presumably, a consistent loan officer would relate the first two variables in a reverse order and the second two variables in the same order, i.e., the higher the estimate of the probability of default the lower the amount of loan recommended and the higher the interest rate charged. Thus, the level of information which produces the highest negative correlation coefficients in the first case and the highest positive correlation coefficients in the second case for a given loan is the level which provides a better degree of consistency, and thus, the most preferable level.

It should be noted, however, that different BLOs may have different experience, different risk attitudes, and may spend different amounts of time analyzing the data and making decisions. It is possible, then, that these decision makers' variables might affect the decisions made regarding the amount of loan and interest rate recommended and/or the default probability estimate made. It would be useful, therefore, to take these decision makers' variables into consideration when measuring consistency. For this reason, partial correlation coefficients between loan amounts or interest rates and estimates of probability of default while holding these decision makers' variables constant would be a better measure of this consistency than simple correlation.

(b) Another measure is the consistency between the probability that the firm will default on a 3-year loan and the probability that it will be a good credit risk over the next 3 years. If a BLO is consistent in making probability estimates, his estimate of the probability that a firm will default on a 3-year loan + his estimate that it will be a good credit risk during the next 3 years should be equal to one.¹² Thus, one minus the sum of these two probability estimates should be a good indication of the extent of consistency. Statistically speaking, if the i -th loan officer's estimate of the probability that the j -th firm will default on the k -th loan is $p(i,j,k)$, then, if he is consistent, his estimate of the probability that this firm will be a good credit risk should be equal to $[1 - p(i,j,k)] = q(i,j,k)$. The extent of consistency is measured by the closeness of the estimates given by BLOs for the attractiveness of credit risk to the scores of $q(i,j,k)$. Or, to put in other words, if the scores of the fourth and seventh variables are added and the total subtracted from 1, then, the closest the resultant is to zero the more consistent the BLO is.

For each loan, differences in this measure of consistency among the four levels of information will be tested. The level of information which gives the highest degree of consistency will be ranked highest on this dimension of preferability. The statistical models and null hypotheses to be used for testing these measures of consistency are discussed in detail in Chapter VI.

Statements of Hypotheses to Test the Set of Criteria:

The null and alternate hypotheses to test the above set of criteria

¹²The same test can also be made for the 6-month loan. However, it was felt that testing on the 3-year loan is sufficient.

may be formulated as follows:

(1) Hypothesis to Test the Degree of Consensus:

$H0_5$: There is no significant difference in the variance of each task variable between the control information level and each of the treatment information levels.

$H1_5$: There is a significant difference in the variance of each task variable between the control information level and each of the treatment information levels.

(2) Hypotheses to Test the Consistency of Decision Makers:

$H0_{6a}$: There is no significant correlation between the variables in the following two-variable sets: 1&2; 1&3; 2&3; 4&5; 4&6; 4&7; 5&6; 5&7; and 6&7.

$H1_{6a}$: There is a significant negative correlation between the two variables in each of the following 2-variable sets:
1&2; 1&3; 4&6; 4&7; 5&6; and 5&7.
and a significant positive correlation between the two variables in each of the following 2-variable sets:
2&3; 4&5; and 6&7.

$H0_{6b}$: There is no significant difference between the sum of the means of variables 4 and 7 across the four information levels.

$H1_{6b}$: There is a significant difference between the sum of the means of variables 4 and 7 across the four information levels.

Hypothesis $H0_5$ will be tested using F test for homogeneity of variance, and $H0_{6a}$ & $H0_{6b}$ will be tested using simple and partial correlations.

The detailed testing methodologies for all the hypotheses developed in this chapter as well as the methods of sample selection and data gathering are discussed in detail in the following chapter.

CHAPTER VI
DATA GATHERING AND RESEARCH RESULTS

Sample Selection and Analysis

A sample of 1,050 commercial bank lending officers (BLOs) at different levels in bank hierarchies was randomly selected from a list of 2,958 BLOs extracted from the 1981 edition of Polk's Directory of Banks and the 1980-1981 membership roster of Robert Morris Associates. The 1,050 subjects were distributed among 240 banks located in 136 Cities in 40 States and the District of Columbia. [See Appendix B for analyses of sample and respondents].

Using a computer program of random selection and assignment, 150 BLOs were randomly assigned to each of the 7 groups illustrated in the basic design of the research [Exhibit V-2]. The random assignment of subjects to the groups had absolutely no restriction.¹

A total of 372 responses were received consisting of 186 valid responses to the first mailing, 81 valid responses to the second request², and 105 questionnaires were returned unfilled for various reasons as

¹While random assignment of subjects to the groups is a desirable remedy for any unintentional bias in the random selection of the sample, it resulted in some multiple mailing to subjects in the same bank and a very limited multiple mailing to subjects in the same office of the same bank. It may be argued that subjects sharing the same office (or even location) may consult with one another on the questionnaire matters and thus responses of this type may, in effect, represent one observation. However, this is not too serious a problem in this study for two reasons: (1) the banks surveyed are relatively large and thus the probability that two or more subjects from the same bank are also working in the same office is very small, and (2) a review of the random assignment of BLOs showed that, in the majority of cases, subjects from the same bank were distributed among different groups and thus received different data sets. Furthermore, in order to make sure of the absence of any collusion among subjects from the same bank and same group, responses received from such subjects were compared upon their receipt. This one-by-one comparison revealed no cause for concern in this regard.

²Of the 267 valid responses 1 response was received very late after all tests have been completed and 3 responses were incomplete and thus these 4 responses were not used in most analysis. Of the 3 incomplete responses 2 respondents indicated that they needed more information to make the required decisions and the third mentioned that the answers to questions 1, 4, and 8 involved confidential proprietary information. It is interesting to note that this third respondent was from one of the 5 largest banks in the U.S. located in New York City which was among the banks participated in the pilot testing phase of this research and all the questions were answered then.

analyzed in Appendix B. If these 105 unfilled questionnaires were taken out of both questionnaires mailed and questionnaires received the response rate would be 28.3%.³ The analysis of respondents in Appendix B are all made net of returns.

As shown in Appendix B, respondents are fairly distributed among banking units, geographical locations, titles and positions at the bank, membership in professional banking associations, bank sizes and bank activity ratios. Therefore, there is no reason to suspect a significant limitation to the sample representation of the population of commercial loan officers.

Testing the Ancillary Hypotheses

Prior to testing the main hypotheses of this research, it is necessary to test two ancillary hypotheses for the reason discussed below.

Testing the First Ancillary Hypothesis: The Difference in Risk Attitude and Experience Among Groups is not Statistically Significant

As discussed in Chapter V, the testing for differences in risk attitude and experience among groups is necessary in order to ascertain, statistically, the absence of significant differences in these personal attributes of decision makers. If significant differences in one or both of these personal attributes are found among groups assigned to different information levels, it will be necessary to isolate the effects of these attributes on decisions regarding task variables, especially if differences among the latter are found significant. Otherwise, the effects of subjects' variables may mask the effects of information levels on task variables, the main focus of this study.

³This is a respectable response rate in view of the fact that BLOs have been flooded with questionnaires in recent years. In fact, it seems that BLOs were being surveyed at the same time they received the questionnaire of this study. In a second request phone call to a BLO he pointed out: "I received two types of questionnaires this past month and mailed them back. I don't know if yours was one of them!".

Student t tests⁴ for differences between means of variable 8 (risk attitude) and variable 9 (experience) were performed and the results are reported in Table C-1 in Appendix C. Because the observations for risk attitude and experience were found [using the Kolmogorov-Smirnov goodness-of-fit test of normality] not normally distributed, the non-parametric Mann-Whitney U test⁵ was also performed and the results are reported in Table C-2 in Appendix C. A look at Tables C-1 and C-2 clearly indicate that both the student t and Mann-Whitney U tests for differences in risk attitude and experience between level 1 (the control group) and each of the other (treatment) levels show that, indeed, there are no differences. Thus, $A-HO_1$ cannot be rejected.

However, taking all subjects' variables (risk attitude, experience, bank size and bank activity ratio⁶) as a group may make it possible to

⁴ The student t test computes t values as follows:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S_d} \quad \text{with } (n_1 + n_2 - 2) \text{ degrees of freedom (d.f.)}$$

where $\bar{X}_1$ and n_1 are the mean and sample size respectively for group or level 1;
 $\bar{X}_2$ and n_2 are the mean and sample size respectively for group or level 2;
 and S_d is the standard deviation for the difference between $\bar{X}_1$ and $\bar{X}_2$, i.e.,

$$\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}} \quad \text{where } S^2 \text{ is the weighted average of the sample variances}$$

and is the best estimation for the population variance, σ^2 .

⁵ Like the student t test, the Mann-Whitney U test can be used to determine whether two samples are from the same population. The two samples are combined, and cases are ranked in order of increasing size. The test statistic U is computed as the number of times a score from sample 1 precedes a score from sample 2. The rationale is that if the samples are from the same population, the distribution of scores from the two samples in the ranked list will be random; a non-random pattern will be indicated by an extreme value of U. For large samples (≥ 30), U is transformed into a normally distributed statistic, Z. Non-parametric tests (such as U) are usually preferred over parametric tests (such as t) whenever the observations are not normally distributed.

⁶ The BLO's title and position at the bank and his membership in a banking association are not thought to have any significant bearing on lending decisions. As indicated in Chapter V, titles vary greatly from bank to bank, and membership in banking associations is an honorary position in most cases. On the other hand, bank size and bank activity ratio could possibly have some effects on lending decisions. For example, large banks can afford the establish-

discriminate among the 7 groups of BLOs. A canonical discriminant analysis was performed to test the above possibility and the results are presented in Table C-3 in Appendix C.

As Table C-3 indicates, none of the discriminant functions is significant even at $\alpha \leq 0.20$. This indicates that neither one of the subjects' variables individually nor collectively can be used as a basis for discrimination among the seven groups of BLOs.

Testing the Second Ancillary Hypothesis: The Interaction Effect Between Information Levels and Presentation Modes is not Statistically Significant

A second ancillary hypothesis was tested in order to determine whether there is an interaction effect between presentation modes and information levels. If that interaction exists, it may be meaningless to test for the effect of information levels or presentation modes on lending decisions, since the existence of the interaction implies a dependent relationship between the two. The 2-factor ANOVA test [See Table C-4 in Appendix C] showed that such an interaction effect did not exist.

Testing the above ancillary hypotheses was made to show that (1) the selection of the sample and the assignment of subjects to groups were not biased toward one level of information or another, (2) respondents have similar experience in evaluating loan applications, (3) there are no differences among groups of BLOs who were assigned to the 4 information levels in terms of their risk attitude, (4) it is not possible to discriminate among the 7 groups even on the basis of four subjects' variables (risk attitude, experience, bank size and bank activity ratio) taken individually or collectively, and (5) there is no interaction effect between information levels and presentation modes.

ment of training programs for their loan officers more than small banks can; and banks with higher activity ratios may be following an aggressive lending policy, i.e., they accept higher risk customers but charge them higher interest rates.

Testing the Main Hypotheses

All tests in this chapter, unless otherwise specified, will be in terms of the following indicies: the index G refers to the group where $G=1,2,\dots,7$; the index i refers to the mode of SFAS 33 data presentation where $i=1,2$; and the index j refers to the level of information where $j=1,2,3,4$. Since the focus of this research is on the effects of information levels on lending decisions, each time the difference among information levels is tested, it will be analyzed in 3 ways: (1) under the first mode of presentation (i.e., when SFAS 33 data are presented only in the notes to the financial statements) where the analysis will take the form:

$G(1) \text{ Vs. } G(2) \text{ Vs. } G(3) \text{ Vs. } G(4)$

(2) under the second mode of presentation (i.e., when SFAS 33 disclosures are presented on the face of the income statement as well as in the notes) where the analysis will take the form:

$G(1) \text{ Vs. } G(5) \text{ Vs. } G(6) \text{ Vs. } G(7)$

and (3) under both modes of presentation combined, where the analysis will take the form:

$G(1) \text{ Vs. } G(2+5) \text{ Vs. } G(3+6) \text{ Vs. } G(4+7)$

Keeping the above in mind, the first main hypothesis, H_{01} , is tested below.

Testing the First Main Hypothesis: The Effect of SFAS 33 Data on Lending Decisions is not Statistically Significant

The first main main hypothesis of this study, H_{01} , was developed in Chapter V and stated that there are no significant differences between lending decisions made using SFAS 33 disclosures and those made using HC data only. This hypothesis can be tested using different statistical models as indicated below.

A. Testing Using One-way ANOVA:

Under the basic design of this research, each subject received the questionnaire with data under only one level of information and one mode of presentation. Such a design is completely randomized for a given information level or a given presentation mode, i.e., observations are independent. The basic statistical model to be used for such a design is the linear model with a fixed treatment.⁷ This model can be expressed as in (1) below.⁸

$$(1) \quad X_{(i,j)}^{(v)} = u_{(i)}^{(v)} + t_{(i,j)}^{(v)} + e_{(i,j)}^{(v)}$$

where :

X = the score of an observation,

u = the mean value of the variable which is assumed to be constant over all levels of information under a given presentation mode,

t = the treatment (either level or mode) effect,

e = the error term, experimental and stochastic for all uncontrolled effects,

(v) = the variable, whether a task, a subject, or an interaction variable,

j = level of information, $j=1,2,3,4$,

i = mode of SFAS 33 data presentation, $i=0$ for $j=1$; and $i=1,2$ for $j=2,3,4$.⁹

The assumptions of the above model are that (1) $\sigma^2(X_{(i,j)}^{(v)}) = \sigma^2(e_{(i,j)}^{(v)})$,

(2) covariance $(e,t) = 0$; (3) expected value of $e_{(i,j)}^{(v)} = 0$, and (4) e and X are normally distributed.¹⁰

⁷ Other models will also be used as discussed later on.

⁸ This model is based on Neter and Wasserman's [1974, pp. 429-36] alternate formulation of Model I for single factor experiments.

⁹ Because the basic design of this research includes only one control group under information level 1 (which includes HC data only), there are no modes of SFAS 33 data presentation under this level. However, as indicated earlier, the control group responses will be used repeatedly for each mode of presentation for information levels 2,3, and 4.

¹⁰ These assumptions may be summarized as $e_{(i,j)}^{(v)} \sim N(0, \sigma^2)$, $X_{(i,j)}^{(v)} \sim N(u_i, \sigma^2)$, and treatment and errors are independent.

Under a given presentation mode i , and for every task variable (v) , the first main hypothesis, HO_1 , may be statistically stated as in (2) below:

$$(2) \quad HO_1^{(v)} : u_{(i,1)}^{(v)} = u_{(i,2)}^{(v)} = u_{(i,3)}^{(v)} = u_{(i,4)}^{(v)} \quad \text{where } i=1,2; \text{ and } (v)=1,2,\dots,7.$$

A one-way ANOVA was performed to test HO_1 above and the results¹¹ are reported in Table VI-1.

Table VI-1
F Ratios from One-Way ANOVA Test for Differences in Means of Each Task Variable
Among the Four Information Levels
[Classified by Presentation Mode]

Mode	T A S K V A R I A B L E N U M B E R*							d.f. [num.,den.]
	1	2	3	4	5	6	7	
1	1.040	1.126	1.287	.434	1.756	.718	.919	[3 ,125]
2	.758	.509	.296	1.355	1.444	.730	1.018	[3 ,117]
Both	.907	.997	.594	1.064	1.304	.415	1.420	[3 ,213]

Note: None of the ratios in the Table is significant at $\alpha \leq 0.10$.

* See Chapter V for definitions of task and other research variables.

Each F ratio in Table VI-1 is an answer to the question: for a given presentation mode (or both modes combined), and a given task variable, have SFAS 33 data affected lending decisions? The inference that may be drawn from these F ratios is the absence of statistically significant effects of SFAS 33 data on any of the 7 lending decisions. This inference holds whether these data were presented only in the notes to the financial statements or on the face of the income statement as well. Also, in terms of the non-central F distribution, for the given degrees of freedom [3, ≥ 117], and

¹¹ HO_1 and all other hypotheses in this research were also tested for large and small banks separately. Large banks are those whose legal lending limit is $\geq \$15$ million and small banks are those whose legal limit is $< \$15$ million. [It may be recalled that the loan amount requested by the company used in this study was \$15 million]. 125 valid responses were received from large banks (47%), and 142 from small banks (53%). Because no statistically significant differences between the results for large and small banks were observed, these separate results are not reported.

for any given α error, each of the above tests has the highest possible power.¹²

Since the one-way ANOVA model tests for the differences among the four information levels simultaneously, a question arises as to whether there are any differences between any two information levels taken at a time. The following pair-wise comparisons provide an answer to this question.

B. Testing Using Pair-wise Comparisons:

Just as in ANOVA, the tests using pair-wise comparisons should show whether two means of the same variable (under a given presentation mode of SFAS 33 data) came from the same population. The two means are obtained by comparing the control information level with each of the treatment information levels. Each comparison under H_{01} can be statistically stated as in (3):

$$(3) \quad H_{01}(i,j) : u_{(i,1)}^{(v)} - u_{(i,j)}^{(v)} = 0 \quad ; \quad j=2,3,4;$$

for any task variable, (v), under any presentation mode, i, and any information level, j [Note: $u_{(i,1)}$ is the same under any i or all i's combined].

The above general hypothesis was tested and the student t values are reported in Table VI-2.¹³

¹² The power of the F test refers to the probability that the decision will lead to rejecting the null hypothesis when, in fact, the null hypothesis is not true. This power is specified as follows:

Power = $P \{ F^* > F(1-\alpha; r-1, N_T - r) | \phi \}$
 where F^* is the computed F ratio, r is the number of j levels, N_T is the grand total number of observations for a variable, and ϕ is the noncentrality parameter, i.e., a measure of how unequal u_j are, and is specified as follows:

$$\phi = \frac{1}{\sigma} \sqrt{\sum_{ij} n_{ij} \frac{(u_{(ij)} - u_i)^2}{r}} = \frac{1}{\sigma} \sqrt{\sum_{ij} n_{ij} \frac{t_{(ij)}^2}{r}}.$$

For an $\alpha = 0.05$ and 4 data treatments, Pearson-Hartly charts indicate that $F[3, 117 | \phi]$ has the smallest β error and thus the highest power function, $1 - \beta$. [See Neter and Wasserman (1974) for Pearson-Hartly charts.]

¹³ Because there is only one control group which is compared repeatedly against each of the 6 treatment groups or combinations thereof, the results of the student t tests throughout this dissertation may be somewhat biased toward higher significance. A more appropriate test is Dunnett's t test known

Table VI-2

Student t Values for the Difference in Means of Each Task Variable
Between the Control Information Level and Each of the Treatment Levels

Presenta- tion Mode	Levels Compared	TASK VARIABLE NUMBER							Degrees of Freedom
		1	2	3	4	5	6	7	
1	1&2	1.32**	.20	.80	.21	.53	-.49	.96	83
	1&3	.62	.75	.70	.45	.33	.43	.94	71
	1&4	1.17	1.75**	.43	-.49	1.63**	.96	1.33**	77
2	1&2	1.39**	.93	.97	2.11*	1.13	1.43**	2.03*	82
	1&3	.02	1.26	-.37	.13	.29	.50	1.08	72
	1&4	.87	1.10	.21	.39	1.02	.98	2.66*	72
B O T H	1&2	1.59	.62	.99	1.49**	.97	.61	1.81*	125
	1&3	.38	1.14	.25	.34	.37	.52	1.16	104
	1&4	1.21	1.68*	.39	-.10	1.59**	1.18	2.20*	110

* Significant at $\alpha \leq 0.05$.

** Significant at $\alpha > 0.05$ but ≤ 0.10 .

Note: All t values, except those with a negative sign, have the correct (i.e., expected) direction. See also footnote 15.

Because both the ANOVA and t tests assume normality of the observations for each variable, the Kolmogrov-Smirnov goodness-of-fit test of normality was performed to determine whether this assumption holds for each variable's observations. It was found that some variables were not normally distributed. Accordingly, the non-parametric Mann-Whitney U test was performed to test H_{01} and the results are reported in Table VI-3.

as "Many-One t Statistic." [See, for example, Miller (1966), Chapter 2, Section 5 and Chapter 5, Sections 1-5]. Since the results of the student t tests in almost all the hypotheses of this research are not statistically significant, the question of whether the use of Dunnett's t test would have produced different results becomes an academic one. Furthermore, Dunnett's table of critical t values assume equal observation in all groups which is not the case in this research.

Table VI-3

**Z Values from the Non-parametric Mann-Whitney U Test
for Differences in Each Task Variable
Between the Control Information Level and Each of the Treatment Levels**

Presentation Mode	Levels Compared	TASK VARIABLE NUMBER						
		1	2	3	4	5	6	7
1	1&2	1.186	.257	.269	.443	.368	.603	.642
	1&3	.538	.411	.847	.541	.171	.035	1.209
	1&4	1.136	1.524*	1.449**	.881	1.400**	.619	1.441**
2	1&2	1.240	.943	.590	1.586**	.579	1.337**	1.585**
	1&3	.052	1.026	.266	.314	.200	.520	.496
	1&4	.860	1.068	1.040	.401	.931	.734	3.152*
BOTH	1&2	1.395**	.404	.497	.650	.542	.437	1.291**
	1&3	.287	.841	.652	.134	.014	.301	1.003
	1&4	1.172	1.599**	1.474**	.355	1.377**	.788	2.639*

* Significant at $\alpha \leq 0.05$.

** Significant at $\alpha > 0.05$ but ≤ 0.10 .

Each t value in Table VI-2 and each Z value in Table VI-3 is an answer to the question: for a given task variable (i.e., lending decision), under a given presentation mode, has any level of SFAS 33 data (CD, CC, or both) led BLOs to make decisions different from those based on the control information level (HC data only)? A basic conclusion that may be drawn from Tables VI-2 and VI-3 is that SFAS 33 information levels have not led BLOs to reach decisions different from those decisions based on the HC data alone. However, there are minor exceptions to this general conclusion as evidenced by some significant t and Z values in Tables VI-2 and VI-3 respectively.¹⁴ While the

¹⁴ The following observations on Tables VI-2 and VI-3 are of special interest: (1) the difference in effect on lending decisions between levels 1&3 is never significant, (2) that between 1&2 and between 1&4 is often significant, and (3) the effect on task variables 2,5 and 7 is often significant.

exceptional cases conform with the theoretical analysis in Chapter IV showing that SFAS 33 data should affect lending decisions, the lack of statistically significant effects of SFAS 33 data on lending decisions ought to be discussed.

There are various reasons why there were no statistically significant effects of SFAS 33 data on lending decisions:

(1) One plausible reason is that SFAS 33 data are just "too new" to be used effectively by loan officers. This implies that there is a learning process involved and at this point in time loan officers have not had enough exposure to SFAS 33 data to process them effectively. This learning process may indeed be a long-term one. SFAS 33 was issued over two years prior to mailing the questionnaires, but two years of time may not be enough, in view of the complexity of the statement, for loan officers to learn to use the information effectively. This was also confirmed through personal interviews made by the researcher during the pretesting phase of the questionnaire as a number of loan officers indicated that they don't fully understand SFAS 33 and its disclosure requirements.

(2) Another possible explanation for the lack of statistically significant effects of SFAS 33 data on lending decisions is that loan officers may already be making subjective estimates of the effects of inflation on their customers' financial statements and feel that their estimates are as reliable as those provided under SFAS 33. However, there is some evidence that this was not the case in this study. First, as shown by the results of testing the fourth main hypothesis later on, BLOs receiving SFAS 33 data took more time in data analysis and making decisions than those not receiving such data which implies that the former groups must have at least read SFAS 33 data in the process of making their

decisions. Second, there is a directional effect of SFAS 33 data on lending decisions. 100% of the 19 significant or large values (i.e., values of ± 1) under both the t and U tests had the correct direction. Furthermore, of all the 63 cases, only 4 (or 6%) had the wrong direction.¹⁵ If loan officers were making their own subjective estimates of inflation effects they would not read SFAS 33 data and there should be no directional effect of SFAS 33 data since the control group would make subjective estimates similar to those of the treatment groups.

(3) A third possible explanation is the phenomenon of information overload discussed in Chapter III. That is, there are limits to the amount of information that can be processed effectively by a loan officer and at a certain point information overload occurs. Information processors deal with information overload in a number of ways. They may just simply resort to some heuristic process and deal with only the information they feel comfortable with, the HC in this case. For example, loan officers may have employed a filtering strategy and reduced the information set by a selection procedure. One such selection procedure is a frame of reference. In discussing this strategy Driscoll and Mock [1976, pp.39-40] state:

¹⁵ Because the firm used in this research was one of the MAACs, it was expected that when inflation effects are disclosed lenders may be inclined to make unfavorable decisions about the firm (e.g., reduce the amount of loan or refuse lending altogether, charge higher interest rates and so forth). Since group 1 did not receive SFAS 33 disclosures, the average amount of the loan recommended for the firm by this group was expected to be greater than the average amount recommended by the other groups. Since the t value is computed as $(\bar{X}_1 - \bar{X}_j)/S_d$ where j refers to groups 2 through 7 [also see footnote 4], then a positive t value for any of variables 1, 4, and 5 and a negative t value for any of variables 2, 3, 6, and 7 means that the lending decision was in the expected (or correct) direction. For ease of presentation, however, the t values for variables 2, 3, 6 and 7 were multiplied by -1 so that only negative t values in Table VI-2 would be the ones having the wrong direction.

"In the case of the frame of reference the HIP [Human Information Processor] will determine which information is important to the judgment based on his past experience or customs. If he has made the judgment before, he might use an implicit model which tells him which types of information are relevant and irrelevant to the judgment. The irrelevant factors (according to his model) will be ignored."

However, there is some evidence, as explained in (2) above, that this was not the case in this study.

(4) A fourth possible explanation for the lack of statistically significant effects of SFAS 33 data on lending decisions is that loan officers reached the studied conclusion (or are convinced somehow, rightly or wrongly) that SFAS 33 data are not relevant, and hence not useful, to them in making their decisions.

However, there is some evidence, as explained in (2) above, that this was not the case in this study.¹⁶

Testing the Second Main Hypothesis: The Effect of SFAS 33 Data Presentation Mode on Lending Decisions is not Statistically Significant

The second main hypothesis, H_{02} , of this study was developed in Chapter V and stated that there are no significant differences between lending decisions made based on data sets with inflation effects disclosures presented only in the notes to the financial statements and those made based on data sets with inflation effects shown also on the face of the income statement. Since the control group (G1) assigned to information level 1 did not receive any SFAS 33 disclosures, H_{02} relates only to the decisions made by the other 6 groups (G2 through G7) who were assigned to

¹⁶ Another possible reason for the lack of statistically significant effects of SFAS 33 data on lending decisions is that the sample size was too small to make all the observed directional effects significant. A statistical computation was made which showed that the sample size required to make all these effects statistically significant is as high as 440 observations. [The sample size in this research was only 267]. Obtaining such a relatively large sample size was beyond the means (economic and otherwise) of this researcher.

information levels 2 through 4. H_{O2} can be tested using various statistical models as discussed below.

A. Testing Using One-way ANOVA:

H_{O2} can be stated statistically as in (4) below:

$$(4) H_{O2(j)}^{(v)} : u_{(1,j)}^{(v)} = u_{(2,j)}^{(v)}$$

where 1 and 2 refer to presentation mode, (v) to each task variable, and j to information levels; j=2,3,4. A one-way ANOVA was performed to test (4) and the results are reported in Table VI-4.

Each F ratio in Table VI-4 is an answer to the question: for a given task variable, under a given information level, or all 3 levels taken together, has the mode of presentation of SFAS 33 disclosures (i.e., either in the notes to the financial statements or on the face of the income statement as well) affected lending decisions? A look at Table VI-4 indicates that, with the exception of a few cases as shown in the Table, the presentation mode does not seem to have affected lending decisions.

Table VI-4

F Ratios from One-way ANOVA to Test for the Effects of SFAS 33 Data Presentation Mode on Each Task Variable

Information Level	T A S K V A R I A B L E N U M B E R							d.f.
	1	2	3	4	5	6	7	
2	.061	.537	.030	.787	1.293	3.330**	.025	[1, 65]
3	.643	.045	1.829	.217	.882	.030	.056	[1, 55]
4	.940	.294	3.184**	1.531	.736	0.000	.684	[1, 58]
2,3&4	.791	.035	2.659**	1.355	.119	1.435	.076	[1,182]

** Significant at $\alpha > 0.05$ but ≤ 0.10 .

H_{O2} can also be tested using pair-wise comparisons as discussed below.

B. Testing Using Pair-wise Comparisons:

H_{O2} as statistically specified in (4) was also tested using student t tests for difference in means of each task variable between the two modes of

presentation under each level of SFAS 33 information and then under all 3 levels combined. The t values from that test are reported in Table VI-5.

Again, each t value in Table VI-5 is an answer to the question: for a given task variable, under a given treatment information level or all

Table VI-5

Student t Values for the Difference in Means of Each Task Variable Between the Two Modes of SFAS 33 Data Presentation

Information Level	TASK VARIABLE NUMBER							d.f.
	1	2	3	4	5	6	7	
2	.06	.64	.12	1.86*	.62	1.87*	1.00	84
3	-.59	.47	-1.06	-.27	-.03	.02	.19	62
4	-.22	-.54	-.19	.84	-.51	-.02	1.18	69
2,3&4	-.43	.30	-.50	1.65*	.04	1.13	1.37**	218

* Significant at $\alpha \leq 0.05$. ** Significant at $\alpha > 0.05$ but ≤ 0.10 .

Note: Unlike the case in Table VI-2, the signs of t values represent neither correct nor wrong direction.

treatment levels combined, has the mode of SFAS 33 data presentation affected that particular variable (lending decision)? The t values in Table VI-5 indicate that, in most cases, the mode of presentation of SFAS 33 disclosures does not seem to have affected lending decisions.

H_{02} was also tested using the non-parametric Mann-Whitney U test because the observations on some variables were found not normally distributed. Table VI-6 presents the Z values for testing H_{02} from the U test.

Table VI-6

Z Values from the Mann-Whitney U Test for the Difference in Each Task Variable Between the Two Modes of SFAS 33 Data Presentation

Information Level	TASK VARIABLE NUMBER						
	1	2	3	4	5	6	7
2	.0712	1.1166	.2333	1.7359*	.2731	1.9862*	.9095
3	.7351	.4809	.5454	.8436	.2996	.3649	.5402
4	.0467	.5176	.4253	.9057	.2922	.0835	1.7000*
2,3&4	.4568	.5135	.3160	1.2097	.1016	1.3509**	1.2073

* Significant at $\alpha \leq 0.05$. ** Significant at $\alpha > 0.05$ but ≤ 0.10 .

The results of the non-parametric test confirm those of the t test and lead to the same conclusion that, with the exception of few cases, the mode of SFAS 33 data presentation does not seem to have affected lending decisions. These results are in conformity with expectations as discussed in Chapter V.¹⁷

Testing the Third Main Hypothesis: The Effect of the Type of SFAS 33 Data on Lending Decisions is not Statistically Significant

The third main hypothesis, H_{O_3} , was developed in Chapter V and stated that there are no significant differences between lending decisions made using different information levels containing different types of inflation effects disclosures, i.e., CD, CC, or both. This hypothesis can be tested using different statistical models as discussed below.

A. Testing Using One-way ANOVA:

As is the case with H_{O_2} , this hypothesis does not relate to the control group (information level 1). Using one-way ANOVA, H_{O_3} can be statistically stated as in (5) below:

$$(5) \quad H_{O_3(i)} : u_{(i,2)}^{(v)} = u_{(i,3)}^{(v)} = u_{(i,4)}^{(v)}$$

where, as before, (v) stands for the variable, 2, 3, and 4 for information levels, and i for the presentation mode.

Table VI-7 presents the F ratios obtained from one-way ANOVA test of H_{O_3} .

¹⁷Even though more cases have correct rather than wrong direction, the directional effect of SFAS 33 data presentation does not seem to have any systematic pattern. This may be due to the lack of a strong theory explaining why presenting SFAS 33 data on the face of the income statement (beside the notes) should have a greater effect on decisions than presenting these same data only in the notes to the financial statements. The fact that Casey (1980) showed that adding the notes (to certain financial ratios, the income statement and balance sheet) does not improve BLOs' prediction of bankruptcy could be a result peculiar to the objective of his study; and after all it does not prove that the income statement leads to a better prediction than the notes. The basic reason for incorporating the second presentation mode in the research design of this study was to provide an added protection against the possibility that some BLOs may not bother to read the notes for lack of time. That is, the main focus was whether there is a difference in the effect on

Table VI-7
F Ratios from One-way ANOVA to Test for the Effects of the Type of
SFAS 33 Disclosures on Each Task Variable

Present- ation Mode	T A S K V A R U A B L E N U M B E R							d.f.
	1	2	3	4	5	6	7	
1	.170	1.077	.797	.551	.701	.911	.964	[2, 93]
2	.579	.022	.344	1.221	.688	.271	.987	[2, 85]
Both	.265	.765	.338	1.240	.003	.262	1.623	[2,181]

None of the ratios is significant at $\alpha \leq 0.10$.

Each F ratio in Table VI-7 is an answer to the question: for a given task variable, under a given presentation mode, has the type of SFAS 33 data affected lending decisions? A possible conclusion that may be drawn from Table VI-7 is that the type of SFAS 33 disclosures (CD, CC, or both) has not affected any of the seven lending decisions of this study. This conclusion holds regardless of presentation mode. However, student t and Mann-Whitney U tests are performed next to determine whether this general conclusion would be confirmed.

B. Testing Using Pair-wise Comparisons:

The null hypothesis, H_{03} , can also be tested using pair-wise comparison between each two treatment information levels taken at a time. Under these comparisons, H_{03} can be statistically stated as in (6) below:

$$(6) \quad H_{03(i,j)} : u_{(i,j)}^{(v)} = u_{(i,j')}^{(v)} ; j \neq j'$$

where (v) stands for the variable, i for presentation mode, and j for information level; $j=2,3,4$.

Table VI-8 presents student t values for testing H_{03} as specified in (6) above. Each t value in Table VI-8 is an answer to the same question answered by each F ratio in Table VI-7. The general conclusion that may be drawn is that there is no significant difference in lending decisions between the second mode of SFAS 33 data presentation and HC data, and not between the first and second mode of SFAS 33 data presentation.

Table VI-8

**Student t Values for the Difference in Means of Each Task Variable
Between Each Two of the Treatment Information Levels**

Mode	Levels Compared	T A S K V A R I A B L E N U M B E R							Degrees of Freedom
		1	2	3	4	5	6	7	
1	2&3	-.59	.50	-.10	.22	-.17	.88	-.02	73
	2&4	-.11	1.41**	-.48	-.67	1.18	1.34**	.35	79
	3&4	.47	.86	-.36	-.90	1.29	.52	.37	68
2	2&3	-1.33**	.45	-1.39**	-1.81*	-.78	-.96	-.75	73
	2&4	-.39	.27	-.71	-1.67*	.03	-.33	.56	73
	3&4	.83	-.17	.58	.22	.72	.53	1.28	63
BOTH	2&3	-1.35**	.68	-.96	-1.24	-.67	-.13	-.58	148
	2&4	-.35	1.26	-.86	-1.79*	.88	.63	.57	154
	3&4	.94	.51	.15	-.50	1.43**	.74	1.13	133

* Significant at $\alpha \leq 0.05$.

** Significant at $\alpha > 0.05$ but ≤ 0.10 .

Note: Negative t values mean wrong direction. See also footnote 15.

be drawn from the t values in Table VI-8 is that the type of SFAS 33 data does not seem to have affected lending decisions with the exception of a few cases as shown on the Table. The third main hypothesis was also tested using the Mann-Whitney U test because (using the Kolmogorov-Smirnov normality test) the observations on a number of task variables were found not normally distributed. The Z values from this non-parametric U test are reported in Table VI-9. Each Z value in Table VI-9 answers the same question as each t value in Table VI-8 does, and the general conclusion that may be drawn from Table VI-9 is the same as that drawn from Table VI-8: the type of SFAS 33 disclosures (CD, CC, or both) does not seem to have affected any of the lending decisions posited in this research.

The explanation of these results is probably the same as in the case of the first main hypothesis.

Table VI-9

2 Values from the Non-parametric Mann-Whitney U Test
for Differences in Each Task Variable
Between Each Two of the Treatment Information Levels

Presenta- tion Mode	Levels Compared	T A S K V A R I A B L E N U M B E R						
		1	2	3	4	5	6	7
1	2&3	.582	.616	.520	1.007	.588	.556	.595
	2&4	.010	1.730*	1.025	.263	1.160	1.075	.780
	3&4	.305	.908	.465	1.380**	1.697*	.466	.166
2	2&3	1.319**	.288	.433	1.671*	.488	.506	.887
	2&4	.108	.244	.267	1.079	.579	.419	1.175
	3&4	1.024	0.000	.883	.664	.769	.383	2.069*
B O T H	2&3	1.277**	.621	.102	.630	.756	.039	.341
	2&4	.090	1.441**	.924	1.037	1.236	.590	1.399*
	3&4	1.073	.668	.929	.455	1.768*	.634	1.746*

* Significant at $\alpha \leq 0.05$.

** Significant at $\alpha > 0.05$ but ≤ 0.10 .

Testing the Fourth Main Hypothesis: The Effect of SFAS 33 Data on the
Time Consumed in Data Analysis is not Statistically Significant

As discussed in Chapter V, the time spent on data analysis and making decisions, is neither a task variable nor a subject variable. It is rather a cross, or an interaction, variable since it is a function of both the decision situation and the decision maker. The last request in the questionnaire was concerned with an estimate of the time the loan officer took in analyzing the data and answering the questionnaire. As indicated in Chapter V, there are two major reasons for asking for this time element: (1) it may be used as an indication of whether or not BLOs analyzed SFAS 33 disclosures in the process of reaching their decisions, and (2) it may be used as a surrogate for the cost of evaluating loan applications.

The null hypothesis to test for the effect of information levels on this time element, H_{04} , was developed in Chapter V and stated that there is no difference between the time taken by the 7 groups of loan officers assigned

to the four levels of information. This hypothesis may be tested using several statistical models as discussed below.

A. Testing Using One-way ANOVA:

Using one-way ANOVA, HO_4 may be statistically stated as in (7) below:

$$(7) \quad HO_{4(i)} : \overset{(14)}{u_{(i,1)}} = \overset{(14)}{u_{(i,2)}} = \overset{(14)}{u_{(i,3)}} = \overset{(14)}{u_{(i,4)}}$$

where i refers to presentation mode, 1,2,3 and 4 refer to information levels, and (14) to the interaction variable number.

B. Testing Using Pair-wise Comparisons:

Student t test can also be used to test HO_4 as statistically stated in

(8) below:

$$(8) \quad HO_{4(i,j)} : \overset{(14)}{u_{(i,1)}} - \overset{(14)}{u_{(i,j)}} = 0 \quad ; \quad j=2,3,4 ;$$

where (14), i and j as defined before.

Because the time spent on data analysis and answering the questionnaire was found not normally distributed, HO_4 was also tested using the Mann-Whiney U test. The F , t , and Z values of testing HO_4 are reported in Table VI-10.

Each F , t , and Z value in Table VI-10 is an answer to the question: is there a significant difference between the time taken by BLOs receiving SFAS 33 data and that taken by BLOs not receiving such data, under a given mode of presentation or both? The general conclusion that may be drawn from Table VI-10 is that there is, in fact, a significant difference between the time taken by the group receiving no SFAS 33 disclosures (the control group) and that taken by the groups receiving such disclosures (the treatment groups). However, as Table VI-10 indicates, there are some exceptions to this general conclusion. Most of these exceptions appear under the second presentation mode. That is, the difference between the time taken by the control group and by the groups receiving SFAS 33 data when these data are shown on the

Table VI-10

F, t and Z Values for Differences in Time Consumed in Data Analysis and Making Decisions Between the Control Information Level and Each of the Treatment Levels

Mode Levels Compared	1	2	Both	Statistic
	Value [d.f.]	Value [d.f.]	Value [d.f.]	
All	.966 [3,103]	2.012**[3,94]	1.438 [3,175]	F
1 Vs. 2	2.25* [81]	0.08 [84]	1.34** [128]	t
1 Vs. 3	1.65* [73]	0.50 [72]	1.26 [104]	
1 Vs. 4	2.07* [48]	2.38* [37]	3.02* [96]	
1 Vs. 2	2.306*	.192	1.455**	Z
1 Vs. 3	1.853*	.779	1.570**	
1 Vs. 4	2.500*	2.232*	2.789*	

* Significant at $\alpha \leq 0.05$. ** Significant at $\alpha > 0.05$ but ≤ 0.10 .

Note: All the t values have the expected direction.

income statement is significantly lower than the difference in time when the same disclosures are made only in the notes to the financial statements or when both modes are combined.

That disclosing SFAS 33 data on the face of the income statement (and the notes) leads to consuming less time than disclosing these same data only in the notes may be an indication that BLOs receiving the disclosures on the income statement (and notes) look at them only there and do not bother reading the detailed notes, perhaps for the lack of time they can afford to spend in support of academic research.

The fact that the time consumed by groups receiving SFAS 33 disclosures is significantly longer than that consumed by the control group indicates two things: (1) the groups receiving SFAS 33 disclosures must have analyzed these disclosures, and (2) the cost of evaluating loan applications when SFAS 33 data are disclosed is higher than when they are not. The conclusion

in (1) above is in contradiction with Diamond and Arnold (1979) study which concluded that BLOs receiving HC-CC ratios did not use these ratios in their decisions. However, as indicated in Chapter II, Diamond and Arnold did not test for the difference in the time consumed by the control and the treatment groups. As to the conclusion in (2) above, since most lending decisions have not been significantly different as indicated by the earlier analysis, the issue of whether SFAS 33' benefits outweigh its cost is brought into question. Nevertheless, any final conclusion about this is deferred until after further analyses are performed.

Testing the Fifth Main Hypothesis: The Effect of SFAS 33 Data on the Degree of Consensus Among Decision Makers is not Statistically Significant

A set of criteria for determining the preferability of information levels (i.e., the degree of consensus and the consistency of decision makers) was discussed in Chapter V. Also in that Chapter, two hypotheses were developed to test for that set of criteria. One of these hypotheses, H_{05} , stated that there is no significant difference in the variance of each task variable between the control information level and each of the treatment information levels. The statistical statement of H_{05} may be specified as in (9) below:

$$(9) \quad H_{05}^{(v)} : \sigma_{(i,1)}^2 - \sigma_{(i,j)}^2 = 0$$

where i stands for presentation mode, $i=1,2$; j for information level, $j=2,3,4$; and (v) for each task variable, $v=1,2,\dots,7$. This hypothesis was tested using the F test for differences between variances taken two at a time.¹⁸ The results of that test are reported in Table VI-11.

¹⁸ The F test [$F = \frac{\text{Larger } S^2}{\text{Smaller } S^2}$ where S^2 is the sample variance] is designed to test the null hypothesis that the difference between variances of the two samples is equal to zero, i.e., $H_0 : \sigma_j^2 - \sigma_{j'}^2 = 0$ where $j \neq j'$. If the probability associated with the F value is $>$ the required α level, H_0 is accepted, and vice versa.

Table VI-11

**F Values from the F test for Differences in Variance of Each Task Variable
Between the Control Information Level and Each of the Treatment Levels**

Mode	Levels Compared	T A S K V A R I A B L E N U M B E R						
		1	2	3	4	5	6	7
1	1&2	1.18	1.50	1.57**	1.29	1.19	1.02	1.53**
	1&3	1.01	1.36	1.20	1.04	1.29	1.74**	1.23
	1&4	1.13	1.27	1.61**	1.11	1.34	2.20*	1.51
2	1&2	1.22	1.03	1.37	2.31*	1.46	2.09*	1.74*
	1&3	1.16	1.50	1.92*	1.30	1.18	1.02	1.62**
	1&4	1.01	1.17	1.06	1.03	1.10	1.69	1.38
B O T H	1&2	1.21	1.25	1.45**	1.84*	1.32	1.63**	1.64*
	1&3	1.08	1.42	1.16	1.15	1.25	1.39	1.41
	1&4	1.09	1.21	1.32	1.08	1.23	1.93*	1.46

* Significant at $\alpha > 0.05$

** Significant at $\alpha > 0.05$ but ≤ 0.10 .

Each F value in Table VI-11 is an answer to the question: given a presentation mode, does the level of information affect the dispersion of a given task decision? A look at Table VI-11 reveals that of the 63 cases reported, only 8 (or 13%) are significant at $\alpha \leq 0.05$ and 7 (or 11%) are significant at $\alpha > 0.05$ but ≤ 0.10 . Thus, the basic conclusion that may be drawn from the Table is that there is no significant effect of SFAS 33 data on the degree of consensus among decision makers. This result may be due to the same reasons explaining the results of testing the first three main hypotheses.

Even though differences in variance estimates between the control level and each of the treatment levels were not significant, the consensus-among-decision-makers criterion is still applicable if the variances were compared under the four information levels in terms of the magnitude of the variance. This comparison was performed on the variances of the 7 task

variables under each presentation mode. The level of information associated with the smallest variance is, statistically speaking, the most efficient and, thus, is considered (implicitly) the one preferred by decision makers. Table VI-12 shows these preferred levels.

Table VI-12

Information Levels Having the Smallest Variance for Each Task Variable

Mode	T A S K V A R I A B L E N U M B E R							P*
	1	2	3	4	5	6	7	
1	2	1	4	4	4	1	1	(1,4) ^a
2	2	1	3	4	2	1	1	1
Both	2	1	4	4	2	1	1	1

P* is a preference relation operating over the column. This relation may be considered implicit.

a A tie between these levels.

A look at Table VI-12 reveals that the treatment information levels do not seem to have any effect on the dispersion of decisions (i.e., consensus among loan officers). The control information level seems to be the one preferred by loan officers in terms of this criterion. Again, this result is probably due to the same reasons explaining the results obtained from testing the first three main hypotheses.

A question arises as to whether the other preferability criteria would lead to the same conclusion. The consistency of decision makers criterion is tested under the sixth main hypothesis below.

Testing the Sixth Main Hypothesis: The Effect of SFAS 33 Data on the Consistency of Decision Makers is not Statistically Significant

To test the consistency of decision makers criterion two null hypotheses were developed in Chapter V. The first, $H_{0(a)}$, stated that there is no significant correlation between variables in the following 2-variable sets:

1&2; 1&3; 2&3; 4&5; 4&6; 4&7; 5&6; 5&7; and 6&7. The alternate hypothesis, $H1_{6(a)}$, stated that there is a significant negative correlation between the two variables in each of the 2-variable sets: 1&2; 1&3; 4&6; 4&7; 5&6; and 5&7, and a significant positive correlation between the two variables in each of the 2-variable sets: 2&3; 4&5; and 6&7.

Referring to the correlation Tables [Tables C-5 to C-8 in Appendix C], $H0_{6(a)}$ is rejected at almost all information levels for the correlation between the two variables in each of the following sets: 1&2; 1&3; 4&5; 4&6; 4&7; 5&6; and 5&7, and was rejected in only few cases with respect to the remaining two sets: 2&3; and 6&7. However, even when $H0_{6(a)}$ was accepted, almost all the signs of the correlation coefficients had the expected direction. Thus, the above results indicate that loan officers were consistent in their decisions regarding task variables at all information levels.

However, the extent of consistency of decision makers is different since the level of significance of the correlation coefficients is not the same under all 4 information levels for any given presentation mode.

Ranking these correlation coefficients, in terms of their significance, among information levels under each mode of presentation may indicate the effect of information levels on the consistency of decisions as a preferability criterion. Table VI-13 shows the levels of information that result in correlations with the highest significance under each presentation mode.

A look at Table VI-13 reveals that no particular SFAS 33 information level seems to be the implicitly preferred by decision makers. However, while $H0_5$ showed that the control information level is the implicitly preferred in terms of the dispersion of decisions, $H0_{6(a)}$ seems to indicate that the control information level is not implicitly preferred by decision

Table VI-13

Information Levels Having the Highest Correlation Significance
Between Each Two Variables Shown

Mode	C O R R E L A T I O N B E T W E E N									P*
	(1&2)	(1&3)	(2&3)	(4&5)	(4&6)	(4&7)	(5&6)	(5&7)	(6&7)	
1	3	2	3	4	3	2	1	2	2	2
2	3	3	3	2	4	2	1	4	4	(3,4) ^a
Both	3	3	3	2	3	2	3	2	4	3

P* is an implicit preference relation as before.

a A tie between these levels.

makers in terms of the consistency of decisions. The variance in the results of the two criteria may be an indication that consensus among decision makers may not necessarily mean that their decisions are consistent and vice versa. That no particular treatment information level (either CD or CC) is clearly and predominantly preferred over the other in terms of the consistency of decisions criterion is in conformity with the FASB's view that both CD and CC data should be disclosed.

However, an important question arises at this point: would the results obtained from the above analysis be confirmed by the remaining preferability criterion? Or, would they be confirmed by performing partial correlations while keeping the subject variables (particularly risk attitude and experience) constant? The partial correlation analysis is considered first below.

Partial correlation coefficients between each two of the task variables (with respect to short-term and long-term decisions separately) while keeping variables 8 and 9 constant are presented in Table C-9 in Appendix C. The ranking of information levels, applying the same implicit preference relation, P*, is presented in Table VI-14.

A look at Table VI-14 reveals that the partial correlation analysis has confirmed the results of the simple correlation analysis. That is, once

Table VI-14
Information Levels Having the Most Significant Partial Correlation
Between Each Two Variables Shown Keeping Risk Attitude & Experience Constant

Mode	PARTIAL CORRELATIONS KEEPING VARIABLES 8 AND 9 CONSTANT									P*
	(1&2)	(1&3)	(2&3)	(4&5)	(4&6)	(4&7)	(5&6)	(5&7)	(6&7)	
1	3	2	2	2	2	4	1	4	4	2
2	3	4	3	4	3	4	1	4	3	(3,4) ^a
Both	3	4	2	4	2	4	1	4	4	4

P* is an implicit preference relation as before.

(a) A tie between these levels.

General Note : Even though a correlation coefficient may have a higher magnitude in one group than a corresponding coefficient in another group, the latter may have higher degrees of freedom and, thus, a higher significance than the former. The difference in the sample size has the same effect on the significance of the simple correlation coefficients.

again, no treatment information level seems to be the implicitly preferred one, and that the control information level is not implicitly preferred. The question again is: would this result be confirmed by part (b) of the sixth main hypothesis? The answer to this question is discussed after testing $H_{06(b)}$ below.

The other null hypothesis for testing the consistency of decision makers, $H_{06(b)}$, stated that there is no significant difference between the sum of the means of variables 4 and 7 across the four information levels.

As indicated in Chapter V, variable 4 (the probability that the firm will be a good credit risk over the next three years) and variable 7 (the probability of default on the three-year loan) are complementary and should add up to 100% if the decision maker is consistent. Put in another way, if the sum of the means of variables 4 and 7 is subtracted from 100% [or if 100% is subtracted from the sum of the means of variables 4 and 7], the resultant (call it, the "Consistency Score") should be zero if the decision maker is perfectly consistent in his decisions regarding these 2 variables.

The consistency score was computed for each information level under each presentation mode. These consistency scores and the level of information having the closest score to zero are reported in Table VI-15.

Table VI-15

The Consistency Scores [Variable 4 + Variable 7 - 100]
and the Implicitly Preferred Information Level

Mode	I N F O R M A T I O N L E V E L				P*
	1	2	3	4	
1	-6.25	-2.22	-4.03	1.70	4
2	-6.25	-7.36	-3.81	1.62	4
Both	-6.25	-4.82	-3.92	1.67	4

* P* is an implicit preference relation as before.

A look at Table VI-15 reveals that level 4 seems to be the one implicitly preferred by decision makers. This may be an indication that both types of SFAS 33 data permit a better determination of a firm's probability of default than either type alone. This interpretation is in conformity with the FASB's view that both CD and CC data are helpful to decision makers.

A student t and a Mann-Whitney U tests were performed in order to determine whether the consistency score under the implicitly preferred level as indicated in Table VI-15 is significantly different from the consistency score under the control and other treatment levels. The results of these tests are reported in Table VI-16.

The t and Z values in Table VI-16 indicate that the consistency scores under the control information level and level 4 are significantly different at least at the 0.10 α level, but in most cases at the 0.05 level. Level 4 consistency scores are also significantly different from those of levels 2 and 3. The above significant tests confirm the inference drawn earlier that

Table VI-16

t and Z Values from Student t and Mann-Whitney U Tests for Differences in Means of Consistency Scores Between Each Two Information Levels Shown

Levels Compared	First Mode			Second Mode			Both Modes		
	t	d.f.	Z	t	d.f.	Z	t	d.f.	Z
1 Vs. 4	2.87*	75	2.663*	2.54*	67	2.298*	3.17*	104	2.943*
2 Vs. 4	1.23	76	1.547**	2.99*	69	2.506*	2.95*	147	2.970*
3 Vs. 4	1.98*	67	1.858*	1.51**	58	1.387**	2.47*	127	2.280*

* Significant at $\alpha \leq 0.05$.

** Significant at $\alpha > 0.05$ but ≤ 0.10 .

Note: All t values have the expected direction.

level 4 is the one most implicitly preferred by loan officers under this consistency criterion. Again, these results seem to lend support to the FASB's view that both CD and CC data are required.

The consistency of decision makers can also be checked by studying the correlations between variables 4 and 7. Since these two variables are complementary, the information level that generates the most significant negative correlation coefficients between them is (implicitly) the most preferred level. Table VI-17 presents Spearman rank-order correlation coefficients and their significance as well as the implicitly preferred information level.

Table VI-17

Spearman Rank-Order Correlation Coefficients (and Their Significance) Between Variables 4 and 7, and the Implicitly Preferred Information Level

Mode	I N F O R M A T I O N L E V E L				P*
	1	2	3	4	
1	-.553 (.001)	-.794 (.001)	-.591 (.001)	-.774 (.001)	2
2	-.553 (.001)	-.849 (.001)	-.665 (.001)	-.690 (.001)	2
Both	-.553 (.001)	-.804 (.001)	-.642 (.001)	-.761 (.001)	2

* An implicit preference relation as before.

The figures in parentheses are the significance levels. In case the significance level is the same the information level with the highest correlation coefficient is considered the implicitly preferred one.

A look at Table VI-17 reveals that level 2 is the most preferred level as shown in the column of the preference relation, P*.

It is noted that the results revealed by Table VI-17 are obviously inconsistent with the results revealed by Tables VI-13 to VI-15. It may be advisable, then, to apply all preferability criteria combined to determine whether, indeed, there is an information level that is implicitly most preferable by loan officers.

Applying All Preferability Criteria Combined:

Since each preferability criterion has imputed a somewhat different ranking to different information levels, it may be instructive to combine all of the criteria in one Table. This is done in Table VI-18.

Table VI-18

Information Levels Implicitly Preferred Under Various Criteria

Criter- ion Mode	Consen- sus ^a	C O N S I S T E N C Y				P**
		Simple Correla- tion ^b	Partial Correl- tion ^c	Consis- tency Scores ^d	Correla- tion Bet- ween V4&V7 ^e	
1	(1,4)*	2	2	4	2	2
2	1	(3,4)*	(3,4)*	4	2	4
Both	1	3	4	4	2	4

a From Table VI-12

b From Table VI-13

c From Table VI-14

d From Table VI-15

e From Table VI-17

* A tie between

these levels.

** A preference relation operating over the

column with respect to all criteria.

A look at Table VI-18 reveals some interesting results:

(a) No information level is implicitly preferred under all criteria. Level 1 (the control) seems to result in more consensus among decision makers; level 2 seems to result in more significant correlations (with signs in the expected direction); and level 4 seems to result in more consistent estimates of the probability of default on the long-term loan.

(b) The control level seems to be the least preferred. It appears in

the preference relation column only under the degree of consensus criterion.

The overall preferability of information levels may also be determined in terms of their frequency of appearance in the preference relation column, i.e., in Table VI-18. Table VI-19 presents the absolute and relative frequencies of appearance in Table VI-18 for each level.

Table VI-19
Absolute and Relative Frequencies of Preference to Each Information Level

Level	Frequency of Appearance in Table VI-40	
	Absolute	Relative
1	2.5	.167
2	5.0	.333
3	2.0	.133
4	5.5	.367
Total	15.0	1.000

The fractions in the absolute frequency are due to ties between levels.

A look at Table VI-19 reveals that level 2 (CD data) and level 4 (both CD and CC data) seem to be the most implicitly preferred levels by loan officers, while level 1 (the control) and level 3 (CC data) seem to be the least preferred. This confirms the results of the statistical analysis reported in Tables VI-2 and VI-3 where the difference in effect on lending decisions between levels 1 and 3 was never significant while it was often significant when levels 1 and 2 and levels 1 and 4 were compared.

That loan officers prefer CD over CC data may imply that they are more familiar with the method of CD calculation and, thus, feel more comfortable with CD than with CC data. The preference of CD over CC data by loan officers may also be due to their belief that CC data are subjective, and, hence, hypothetical and not reliable. This preference, which is in contradiction with the theoretical analysis in Chapter IV, may be an indication of the possibility that loan officers do not factor into their decisions certain CC data which the theoretical literature suggest should be helpful to them in

making their decisions.

That the level of information containing both CD and CC data is preferred over other levels is in conformity with the FASB's view that both types of data are helpful to decision makers and thus should be disclosed.

Some other analyses may be performed to determine whether there is a logical relationship among variables and between each two of them taken at a time. For example, the relationship between the short-term loan (variable 1) and the probability of default on that loan (variable 3) should be negative and significant. The same is true with respect to the relationship between the long-term loan (variable 5) and the probability of default on that loan (variable 7). On the other hand, the relationship between the probability of default on the short-term loan and the interest rate over prime on the same loan should be positive and significant. The same is true with respect to the relationship between the probability of default and the interest rate on the long-term loan. While some of these correlations were tested earlier under the fifth and sixth main hypotheses, other correlations are of interest and are tested below.

Testing the Relationships Among All Variables

Testing the relationships among all variables: task variables, subject variables (risk attitude and experience only) and the interaction variable can be tested using various statistical tools as discussed below.

A. Testing Using Simple Correlation:

Since the observations on some variables were not normally distributed, the Spearman Rank-Order Correlations were performed to determine the correlation coefficients between each two variables under each information level, and presentation mode.¹⁹ These correlation coefficients are shown in Tables

¹⁹The Pearson-moment and Kendall rank-order correlations were also performed but the significant correlations were almost the same as under the Spearman rank-order correlations. Hence, the former correlations are not reported.

C-5 through C-8 in Appendix C. For each correlation, the null hypothesis, $H_0 : r = 0$ is tested against the alternate hypothesis, $H_1 : r \neq 0$ (at the 0.05 level of significance) where r is the correlation between each two variables taken at a time. Following is an analysis of some important relationships.

Analysis of the Relationships Among Variables:

Based on the correlation coefficients in Tables C-5 through C-8, the following relationships are of interest:

(1) With minor exceptions, the relationships between the 6-month loan (variable 1) and the interest rate over prime on that loan (variable 2); between the 3-year loan (variable 5) and the interest rate over prime on that loan (variable 6); between the 6-month loan and the probability of default on that loan (variable 3); and between the 3-year loan and the probability of default on that loan (variable 7) were found both negative and significant for all information levels and presentation modes. While these relationships were expected, SFAS 33 data did not seem to influence the significance of the correlation coefficients.

(2) Also as expected, the correlation coefficients between the probability that the firm will be a good credit risk over the next 3 years (variable 4) and the 3-year loan, and between variable 4 and the 6-month loan were found positive and significant. Again SFAS 33 data did not seem to influence the degree of correlation significance.

(3) The correlation coefficients between variable 4 and the probability of default on the 3-year loan (variable 7), and between variable 4 and the probability of default on the 6-month loan were found both negative and significant for all information levels and presentation modes. However,

the correlations between variable 4 and variable 6 was found negative but significant in only 60% of the cases. Again, SFAS 33 data did not seem to have any noticeable effect on the significance of these correlations.

(4) The correlations between variables 2 and 3 and between variables 6 and 7, while they were expected to be positive and significant, were found to be so in only 30% of the cases. Again, SFAS 33 data did not seem to affect the significance of these correlations.

The reasons why SFAS 33 data did not seem to influence the degree of significance of all the above correlations are probably the same reasons given for the lack of their effect in the first three main hypotheses.

(5) The relationships between the 6-month loan (variable 1) and the 3-year loan (variable 5) were both positive and significant in all cases.

None of the significant correlations was higher than .776, which implies that BLOs evaluate the degree of risk of the same borrower differently for different maturity loans. It is interesting to observe the direction of this difference. The means of the 6-month loan and the 3-year loan under all information levels and presentation modes were compared and it was found that, on the average, loan officers recommend a smaller 3-year loan than a 6-month loan in all cases. This is in confirmity with expectations. In general, short maturity loans are preferred, and the longer the maturity, the higher the risk.

The above implication may also be checked by considering the nature of correlations between the probability of default on the 6-month loan (variable 3) and that on the 3-year loan (variable 7). These correlations were found both positive and significant in 80% of the cases. However, in 100% of the cases,

the mean probability of default on the 3-year loan was higher than that on the 6-month loan. This confirms that, indeed, the longer the maturity, the higher the risk of default.

In an attempt to determine the influence of SFAS 33 disclosures on the difference between the probability of default on short-term loans and that on long-term loans, that difference was computed for each information level and presentation mode as shown in Table VI- 20.

Table VI-20
Differences Between the Mean Probability of Default on the 3-year Loan and the Mean Probability of Default on the 6-month Loan (Var.7 - Var.3)

Information Mode \ Level	2	3	4
1	2.11	2.66	6.53
2	6.40	9.53	13.68
Both	4.30	6.14	9.85
Total	12.81	18.33	30.06
Control Level	2.52		

A sign analysis may be applied to Table VI-20 such that a treatment information level gets a [+] if it results in a greater difference (variable 7 less variable 3) than that obtained under the control level, a [-] if it results in a smaller difference, and a [0] if it results in an equal difference, the following relationships are obtained:

Information Mode \ Level	2	3	4
1	-	+	+
2	+	+	+
Both	+	+	+

These relationships seem to suggest that BLOs receiving SFAS 33 data estimate a firm's probability of default on long-term loans higher than its

probability of default on short-term loans than BLOs not receiving SFAS 33 data for the same firm. This is in conformity with expectations since, in general, the effects of inflation are more significant in the longer than in the shorter run. The total of the difference under each information level in Table VI-20 seems to suggest that CC data have a greater effect than CD data, but both data have a greater effect than CC data alone. That CC data have a greater effect than CD data is in conformity with the theoretical analysis in Chapter IV. That both CD and CC data have a greater effect than either type alone seems to lend support to the FASB's view that both types of data are helpful to decision makers.

The implication that longer maturity loans have higher risk than shorter maturity loans can further be checked by considering the correlations between the interest rate on the 6-month loan (variable 2) and that on the 3-year loan (variable 6). These correlations were found both positive and highly significant (most of them at $\alpha \leq 0.01$) for all information levels and presentation modes. It was also found that the mean interest rate on the 3-year loan was higher than that on the 6-month loan under all information levels and presentation modes as shown in Table VI-21 below where no entry has a negative sign.

Table VI- 21
Differences Between the Mean Interest Rate Over Prime
on the 3-year Loan and That on the 6-month Loan (Variable 6 - Variable 2)

Information Mode \ Level	2	3	4
1	.403	.477	.451
2	.661	.392	.538
Both	.524	.434	.488
Total	1.588	1.303	1.477
Control Level	.516		

(6) The correlation coefficients between other short-term and long-term decisions (i.e., 1&7; 2&4; 2&5; 2&7; 3&4 and 3&6) were also analyzed and it was found that at least the signs of the coefficients were in the expected direction, but the relationships were, in many cases, not significant.

There was no apparent systematic effect of information levels and presentation modes on these correlations.

(7) Significant correlation coefficients between each of the subjects variables (experience and risk attitude) as well as the interaction variable and each of the task variables are few and do not display any consistency. Furthermore, the correlations between risk attitude and experience do not have the same sign under various information levels even though there are more negative than positive signs. However, from the direction of correlation signs and from the few significant cases observed, there seem to be some logical relationships between these subject and interaction variables and each of the task variables. For example, it was found that the longer the time the loan officer spends in data analysis and making decisions, the lower the amount of loan he is willing to lend, the higher the interest rate he charges, and the higher the probability of default he estimates [all for short-term and long-term loans]. This may imply that as the BLO spends more time in the analysis of the additional SFAS 33 data, he becomes more dissatisfied with the company's performance (which was one of the MAACs) and thus makes unfavorable decisions about it. To check this implication, the sign analysis used earlier was applied to Table VI-22 (showing the means of certain task variables as well as the time spent in data analysis and making decisions) such that a treatment information level gets a [+] if two conditions existed simultaneously: (a) the BLO spends more time, and (b) makes unfavorable decisions than under the control level, a [-] if these two conditions did not exist simultaneously, and a [0] if both the time spent

Table VI-22

Means of Certain Task Variables and the Time Spent in Data Analysis
[Classified by Information Level and Presentation Mode]

Mode	Level	V 1	R 2	I 3	A 5	B 6	L 7	E 14
1	2	6.49	.65	17.5	6.19	1.05	19.6	1.04
	3	7.30	.74	16.8	6.43	1.21	19.5	.95
	4	6.63	.89	14.8	4.63	1.34	21.4	1.22
2	2	6.41	.75	18.2	5.41	1.41	24.6	.75
	3	8.17	.83	10.9	6.48	1.22	20.5	.81
	4	6.95	.79	13.9	5.36	1.33	27.6	1.44
Both	2	6.45	.70	13.8	5.81	1.23	22.1	.90
	3	7.73	.78	13.8	6.46	1.22	20.0	.88
	4	6.78	.85	14.4	4.97	1.33	24.2	1.32
The Control Level		8.20	.62	12.7	6.93	1.13	15.2	.74

and the particular decision are almost the same as those under the control level. The results of this sign analysis are shown below:

Mode	Level	V 1	A 2	R 3	I 5	A 6	B 7	L E R
1	2	+	+	+	+	-	+	
	3	+	+	+	+	+	+	
	4	+	+	+	+	+	+	
2	2	+	+	+	+	+	+	
	3	+	+	+	+	+	+	
	4	+	+	+	+	+	+	
Both	2	+	+	+	+	+	+	
	3	+	+	+	+	+	+	
	4	+	+	+	+	+	+	

These relations clearly indicate that based only on the direction (but not necessarily the significance) of the correlations, the more time a BLO spends on data analysis the more unfavorable decisions he

makes about firms which are most adversely affected by inflation as reflected by SFAS 33 disclosures.²⁰

In conclusion, the above correlation analysis did not reveal any additional significant effects of SFAS 33 disclosures on lending decisions. Whatever effects that were revealed were mostly directional effects with few significant cases. It should be noted, however, that simple correlation considers only two variables at a time while all task variables as a group may be influenced by the important subject variables as another group. Thus, it may be necessary to perform some multivariate analysis before making any final conclusions about the relationships among the variables. The multivariate canonical correlations are performed next.

B. Testing Using Canonical Correlation:

Just as multiple correlation extends simple correlation to the case where there are several X (independent) variables, canonical correlation extends simple correlation to the case where there are several X (independent) variables and several Y (dependent) variables. The canonical correlation coefficient, r_c , is determined as specified in (10):

$$(10) \quad r_c = \frac{\text{Cov}(X^*, Y^*)}{\sqrt{\text{Var}(X^*) \text{Var}(Y^*)}}$$

where :

X^* is a linear combination of p X-variables defined as:

$$X^* = a_1 X_1 + a_2 X_2 + \dots + a_p X_p.$$

²⁰ There were other interesting relationships but they had nothing to do with the effects of SFAS 33 data, i.e., these relationships were the same under the control and treatment information levels. Some of these relationships are: (a) the less risk averse the loan officer, the higher the interest rates he charges and the higher the probability of default he estimates on both short and long term loans, (b) the longer the loan officer's experience, the higher the amount of loan he is willing to lend, the lower the interest rate he is willing to charge, and the lower the probability of default he estimates, again both for short and long term loans, and (c) the longer the loan officer's experience, the less time he takes in data analysis and making decisions.

Y^* is a linear combination of q Y -variables defined as:

$$Y^* = b_1 X_1 + b_2 X_2 + \dots + b_q X_q.$$

The objective of canonical correlation is to determine the unknown a_1 and b_1 coefficients such that the correlation between Y^* and X^* will be a maximum.²¹ To test the null hypothesis that the q Y -variables are uncorrelated with the p X -variables, a Chi-square distribution can be used with a $p \times q$ degrees of freedom for the first canonical correlation and $(p-1)(q-1)$ degrees of freedom for the second canonical correlation. Table VI-23 contains the first and second Chi-square values (for the first and second canonical correlations), classified by information level and presentation mode where decision makers' variables [numbers 8, 9, 12, 13, and 14] are used simultaneously as the predictor (independent variables) vector, and the task variables [numbers 1 through 5] as the criteria (dependent variables) vector.²²

Analysis of the Relationship Between Subject Variables and Task Variables

The results of the canonical correlation analysis reported in Table VI-23 indicate that, with the exception of the control information level, there is no significant association (at the .05 level) between the subject

²¹The associated linear combinations X^* and Y^* are called the first canonical variables, and the maximum correlation coefficient between the 2 variable sets is called the first canonical correlation coefficient and is defined as: $r_{(1)}^c$. The second canonical correlation is determined by a linear combination X^* and Y^* such that of all linear combinations uncorrelated with X^* and Y^* these second canonical variables will produce the second largest canonical correlation, $r_{(2)}^c$. The third, fourth, etc. canonical correlations are determined in a similar way.

²²In canonical correlation there is a restriction that the number of criteria (dependent) variables must be less than or equal to the number of predictor (independent) variables. This restriction made it impossible to include all the 7 task variables in the analysis. However, one of the two task variables not analyzed, (variable 6), is similar to variable 2, and the other, (variable 7), is complementary to variable 4.

Table VI-23

Chi-Square Values for the First and Second Canonical Correlations
[Classified by Information Level and Presentation Mode]

Mode	Level	First Chi-Square ^a	First Difference ^b	Second Chi-Square ^c
1	2	34.67	4.66	8.31
	3	31.51	7.82	13.21
	4	19.18	20.15	7.80
2	2	24.29	15.04	9.54
	3	25.36	13.97	12.16
	4	18.47	20.86	8.49
Both	2	26.10	13.23	6.80
	3	36.22	3.11	17.12
	4	24.41	14.92	7.47
The Control Level		39.33*		17.51

(a) First canonical degrees of freedom = (no. of predictors) x (no. of criteria) = (5) x (5) = 25.

(b) First difference = First Chi-square value at the control level minus 1st Chi-square value at the particular treatment level.

(c) Second canonical d.f. = (5-1) (5-1) = 16.

* Significant at $\alpha \leq 0.05$. [Critical value for first Chi-square at $\alpha = 0.05$ and d.f.=25 is 37.65; Critical value for second χ^2 at $\alpha = 0.05$ and d.f.=16 is 26.30]

variables as a group and the task variables as another group under any information level and presentation mode. That is, using 5 subject variables (risk attitude, experience, bank size, activity ratio, and time spent in data analysis) to predict the first five task variables of this study is not possible. It is interesting to note, however, that this prediction is possible only under the control information level. What conclusions may be drawn from this? It may be recalled that a not-significant χ^2 value implies accepting the null hypothesis that the two sets of variables (subject variables and task variables) are not significantly correlated. The fact that the first canonical χ^2 value under the control level is significant at the

0.05% level can only imply that, under this level, a significant portion of the variation in lending decisions can be explained by the decision makers' variables; or that decision makers' variables can predict decision variables [with 95% confidence]. This is not the case, however, when SFAS 33 data are disclosed. Thus, in the absence of SFAS 33 disclosures, decision making is more influenced by the unique attributes of the decision maker (his experience, risk attitude, etc.). As SFAS 33 data are disclosed, loan officers' decisions are influenced less and less by their personal attributes and, presumably, are influenced more and more by SFAS 33 data.²³ Furthermore, a look at Table VI-23 reveals that the first canonical χ^2 values take on a systematic pattern: under each presentation mode and under both modes combined, level 4 (which includes both CD and CC data) results in the lowest χ^2 values (and, thus, the highest first differences). That is, when both CD and CC data are disclosed, BLOs' decisions are least affected by their personal attributes and, presumably, are most affected by these CD and CC data. Again, this seems to support the FASB's view that both types are needed. The second canonical χ^2 values also depict a systematic pattern: under each presentation mode as well as under both modes combined, level 3 (CC data) results in the highest χ^2 values. This may imply that CC data have the least effect on decisions [a result contrary to the theoretical literature as discussed in Chapter IV], and, thus, if loan officers cannot have both CD and CC data and have to choose between either CD or CC data, they would probably prefer CD data. This implication confirms the results of applying the preferability criteria discussed earlier.

The first differences in Table VI-23 indicate that the mode of SFAS 33 data presentation does not seem to affect the first canonical χ^2 values when

²³As indicated under the testing of the first main hypothesis, the influence of SFAS 33 data on lending decisions is a directional one and not statistically significant in most cases.

both CD and CC data are disclosed (i.e., under level 4 as the differences are almost the same under mode 2 as under mode 1 and somewhat lower under both modes combined). However, the second presentation mode (disclosing SFAS 33 data on the income statement beside the notes) seems to have some effect as it results in lower χ^2 values for CD data and for CC data than the first mode.

In conclusion, the canonical correlation analysis has confirmed, for the most part, the results of the simple correlations: that subject variables are not significantly correlated with task variables. The only major point brought about by the canonical correlation is that SFAS 33 data seem to reduce the effect of the decision maker's personal attributes on his decisions. That is, lack of SFAS 33 data appears to require more efforts on the part of loan officers in interpreting financial accounting information.

In summary, while no statistically significant effects of SFAS 33 data on lending decisions were obtained in this study, it was found that (a) SFAS 33 data have directional effect on lending decisions (observed in testing the first main hypothesis), (b) the longer the time loan officers spend in the analysis of SFAS 33 data, the greater the directional effect (observed in testing the fourth main hypothesis and from correlation analysis), (c) SFAS 33 CD and CC information combined seem to lead to a better estimate of the probability of default (H_{05} and H_{06}), and (d) as SFAS 33 data are disclosed, loan officers depend less and less on their personal attributes, and, presumably, more and more on SFAS 33 data in making their decisions. In view of the above conclusions, the question raised earlier as to whether SFAS 33's benefits outweigh its costs becomes a moot one.

The following chapter presents summary and conclusions of the study, its limitations, and recommendations for further research.

CHAPTER VIISUMMARY, CONCLUSIONS, LIMITATIONS, AND RECOMMENDATIONSSummary and Conclusions

Measuring and reporting the effects of changing prices have been debated in the accounting literature for over 60 years. After that long period of debate, the FASB has issued one of, if not, the most important of its statements of financial accounting standards: SFAS 33. That statement required certain large enterprises to report CD and CC data as supplementary disclosures to the HC primary financial statements. The effects of this statement will undoubtedly be studied from various angles.¹

The objective of this research study was to investigate, both theoretically and empirically, the effects of SFAS 33 on lending decisions.

Chapter II presented a review of both the theoretical and empirical literature related to GPLA data and RC disclosures (the two equivalents of CD and CC data respectively under SFAS 33). The theoretical literature review included a critical discussion of the HC/ND basis and 3 alternative bases of financial reporting: HC/CD, CC/ND, and CC/CD. The discussion covered the principles and assumptions underlying each basis (and where applicable, the problems caused by those principles and assumptions) as well as the arguments for and against each. As the detailed discussion in Chapter II indicates, each basis has its proponents and opponents. Nevertheless, the CC/CD basis was shown, theoretically, to overcome most of the problems inherent in the other bases. However, it is still technically difficult to implement and probably more difficult to understand by most financial statement users. This is probably why most of the empirical studies concentrated on the other 2 alternatives to the HC/ND basis: the HC/CD and CC/ND bases.

Section Two of Chapter II presented a critical review of five different

¹See, for example, "News Report" in Journal of Accountancy [August, 1982, p. 10] which lists 12 research projects focusing on SFAS 33 which

types of empirical research studies:

(A) Studies investigating the effects of adjustments for changing prices on the elements of financial statements and ratios based thereon. The review of these studies showed a significant impact of inflation adjustments on these elements and ratios.

(B) Studies investigating the ability of income measurements adjusted for changing prices (vis-a-vis the HC/ND income) to predict an object or an event of interest (e.g., future income, future cash flow, business failure, etc.). The review of these studies indicated mixed predictive ability.

(C) Studies examining the perceived usefulness (by preparers and various user groups) of accounting data adjusted for changing prices. The review of these studies indicated that CD and CC data are perceived by both preparers and users as not useful but perhaps confusing and/or misleading.

(D) Studies showing the usefulness and ranking (by various user groups) of accounting data adjusted for changing prices relative to other information items. The review of this group of studies indicated that even though the inflation-adjusted information item is ranked either last or near last, it is given a score near the arithmetic midpoint which is usually labeled something like "of some usefulness." The present study has confirmed this conclusion. The note on inflation effects was ranked eighth of nine notes (preceding only the 'principles of consolidation' note) but had a score of 3.1 on a scale from 1 to 5, which means that bank loan officers considered it somewhat helpful to them in making their decisions.

(E) Studies investigating the effects of adjustments for changing prices on decisions. The review of these studies indicated mixed effects on decisions, with the majority of studies showing that adjustments for changing prices are sponsored by the big-8 CPA firms, the FASB and AICPA. None of these projects, however, is studying the effects of SFAS 33 on lending decisions.

prices have no statistically significant effects on investment and lending decisions.

Chapter III was devoted toward developing a framework of the decision making model of credit grantors. The chapter included an extensive review of the literature pertaining to the decision making model of commercial lenders in general and to the credit analysis function of the model in particular. After discussing the input variables or factors involved in lending decisions and the specific financial information requirements of bank loan officers, a framework of the decision making model of commercial BLOs was outlined as shown in Exhibit III-9.

Chapter IV presented an attempt to answer a basic question: are SFAS 33 disclosures helpful to lenders in making their decisions? It contained a detailed analysis of SFAS 33 disclosures and why the FASB and others believe that these disclosures are helpful to lenders in making their decisions. It also included an analytical determination of whether these disclosures fit into the decision making model of lenders as outlined in Chapter III. This analysis showed that most of SFAS 33 disclosures, especially CC data, do fit into the decision making model of lenders. It also showed that the majority of ratios used by lenders in making their decisions would be more meaningful if computed using SFAS 33 data rather than HC data. Exhibit IV-1 contains a summary of the results of this analysis.

The empirical investigation of the effects of SFAS 33 on lending decisions was covered in Chapters V and VI.

Chapter V presented the research design, variables, and hypotheses.

In order to determine empirically whether SFAS 33 data affect lending decisions, a loan decision situation was structured and a field study, using questionnaire, was conducted. Decision makers chosen were commercial BLOs who received the annual report of an actual company whose income has been

drastically reduced (from \$5 million profit to \$8 million loss) as a result of adjustments for the effects of changing prices as required by SFAS 33. Loan officers were classified into 7 groups. The first received no SFAS 33 data and was used as a control group. Each of the 6 treatment groups received one piece of SFAS 33 data (either CD, CC, or both) which was either presented in the notes to the financial statements or on the face of the income statement and notes as shown in the basic design in Exhibit V-2.

A sample of 1050 loan officers were randomly selected from among commercial loan officers in 40 States and D.C., 135 Cities, and 240 banks and were randomly assigned to the 7 groups indicated above. Valid responses were received from 267 subjects from 143 banks in 85 Cities in 35 States.

The research variables were classified into three types: (1) task variables concerning two loans (one for short term and one for long term), estimate of the interest rate to be charged and probability of default on each loan, (2) subject variables concerning the decision maker's risk preference, experience, title, membership in banking associations, bank size, and bank activity ratio, and (3) an interaction variable which is the time consumed in data analysis and making decisions.

Six main null hypotheses were developed: (1) SFAS 33 data do not lead to decisions different from those based on HC data, (2) SFAS 33 data presentation mode does not affect lending decisions, (3) the type of SFAS 33 data does not affect lending decisions, (4) SFAS 33 data do not affect the time spent in data analysis and making decisions, (5) SFAS 33 data do not affect the degree of consensus among decision makers, and (6) SFAS 33 data do not affect the consistency of decisions. Two other ancillary null hypotheses were also developed: (1) there is no difference among groups of BLOs with respect to their risk attitude and experience, and (2) there is no interaction effect

between SFAS 33 information levels and presentation modes.

Chapter VI presented the statistical tests of the research hypotheses as well as an analysis of the results of those tests. It also included a discussion of the sample selection and analysis. Following is a brief summary of the research results.

One initial expectation was that lending decisions should be affected by SFAS 33 data, especially when the income of the company used in the study was drastically lower under SFAS 33 requirements than its HC counterpart. With the exception of a few significant cases, this expectation was not realized if one abides by the significance of the statistical tests. It is noted, however, that while the effect of SFAS 33 data on lending decisions was not statistically significant, it had the correct (i.e., expected) direction in about 94% of the cases. That is, SFAS 33 data did lead BLOs to make more unfavorable decisions (about the firm which was one of the most adversely affected by SFAS 33 disclosures) than the HC data. However, the difference between the decisions based on SFAS 33 data and those based on the HC data was not, as stated above, statistically significant. The lack of statistically significant differences in decisions is probably due to the fact that SFAS 33 data are "too new" for BLOs to analyze effectively.

Another initial expectation was that CC data will lead to decisions different from those based on CD data as indicated by the analysis in Chapter IV showing that BLOs should prefer CC over CD data. The opposite of this expectation was realized. First, the statistical tests showed no significant differences between decisions based on CC data and those based on CD data. Second, applying a purely deductive preference relation according to

several preferability criteria (involving the degree of consensus among decision makers and of the consistency of their decisions), it was found that loan officers prefer CD over CC data. This may imply that loan officers are more familiar with the method of restating HC to CD and thus feel more comfortable with CD than with CC data. It may also be an indication of the possibility that BLOs do not factor into their decisions certain CC data which the theoretical literature suggest should be helpful in making those decisions.

Two other expectations of the study were materialized: (1) It was expected that loan officers receiving SFAS 33 data will take more time in data analysis and making decisions than officers not receiving such data. The statistical tests showed this to be true in most cases. One interesting "directional" effect of SFAS 33 data resulted from these tests: the more time loan officers spend in data analysis (presumably in reading SFAS 33 data since the time spent by the treatment groups was significantly longer than that spent by the control group), the more unfavorable decisions they make about the firm which was one of the most adversely affected by inflation.² (2) It was expected that the mode of SFAS 33 data presentation will not have any effects on decisions, particularly if there is an indication (as shown above) that the note on inflation effects has been read. The statistical tests showed that this was the case.

Two other minor expectations were realized. It was hoped that there will be no significant differences among groups of BLOs in terms of their risk attitude and experience and no interaction effect between information levels and presentation modes. The statistical tests confirmed these expectations.

²This was also confirmed by the simple correlation analysis.

A further interesting result of this research was obtained by comparing canonical correlation values of Chi-square relating subject variables as a set to task variables as another set for each of the 7 groups. This canonical correlation analysis confirmed the absence of significant association between subject variables and task variables except under the control group. One possible conclusion that can be drawn from this is that in the absence of SFAS 33 data, loan officers depend more and more on their personal attributes and less and less on financial information. As SFAS 33 data are disclosed, loan officers depend less and less on their personal attributes and, presumably, more and more on SFAS 33 data in making their decisions. Thus, lack of SFAS 33 data appears to require more efforts on the part of loan officers in interpreting the data.

Limitations

As in any other research, the conclusions of this study have certain limitations. The purpose of discussing these limitations is two-fold: (1) to delineate some boundaries within which the conclusions may be interpreted and generalized, and (2) to provide some possible guides to future research efforts in this area. The limitations of this research are divided into two types: (a) those related to research methodology, and (b) those related to research design.

A. Limitations Related to Research Methodology

Even though the questionnaire has long been a popular research vehicle (perhaps because of its low cost to administer³), there are several limitations

³ Indeed, as Frishkoff [1982, p. 7] notes, several of the more important questionnaire studies have emanated from the work of those most impoverished of researchers—Ph. D. candidates.

to this methodology. Following is a discussion of the most important of these limitations and their impact on this study.

First, addressees may pass the chore on to others, perhaps to less-informed subordinates. Several controls were constructed in the development of the questionnaire used in this study in order to gain some idea about the extent to which this problem prevailed;⁴

(a) Even though the title of each addressee was known in advance, each respondent was asked to provide his title and position at the bank. If, for instance, the questionnaire was addressed to an Executive Vice President or a Senior Vice President and the respondent carried a lower title, this would be an evidence that the addressee has relegated the questionnaire to a subordinate. Some evidence of this appeared in this study but its extent was negligible. As shown in Appendix B (Table B-14), few Executive Vice Presidents and Senior Vice Presidents seem to have relegated the questionnaire to Assistant Vice Presidents, Commercial Loan Officers, and Others.

(b) Even though some addressees were known in advance to be members of RMA, each respondent was asked to indicate whether or not he was a member of a professional banking association and in case of a 'yes' answer to indicate which association. A one-to-one comparison was made of each valid response upon arrival to determine whether members and non-members of RMA indicated that they were so. This comparison revealed that this was true with very few exceptions.

Second, the one-way communication that characterizes the questionnaire methodology precludes the subject from seeking explanations and, thus, the resultant responses may reflect confusion by, or lack of comprehension of, the questions. In order to determine to what extent this problem prevailed

⁴It should be noted, however, that, as discussed in Chapter V, this was not the only purpose of including these questions in the questionnaire.

in this study, all the decisions made by every respondent were looked at simultaneously to see whether the respondent is consistent, i.e., that his responses make sense if taken as a group. For example, if a respondent estimated that there is a 90% probability that the company will default on a loan but he still recommended a loan of \$15 million or even any amount at all, he is not a consistent decision maker. This one-by-one analysis revealed only three such inconsistent responses and they were deleted from the analysis. Moreover, a test was performed to correlate certain variables that are known, a priori, to have either a negative or a positive correlation. Such correlation analysis revealed that loan officers were quite consistent in their decisions implying that they were not confused by, or lacked the comprehension of, the questions.

Third, the confusion or lack of comprehension problem discussed above may be looked at from a different point of view. That is, respondents may not be confused by the question and thus may not need any further explanation but may misunderstand the nature or the purpose of the questionnaire. For instance, if loan officers thought for a moment that their capability was being tested, they would respond in such a way that they would pass the test or not respond at all. However, the covering letters from the Chairman of the Dissertation Committee and the researcher, shown in Appendix A, clearly indicated the academic nature of the study. Furthermore, the correlation analysis between each two of the task variables for each respondent has revealed that no responses seemed to lack honesty in any way.

Fourth, respondents may understand the questions as well as the nature and purpose of the study but still they may perceive the posed decision situation differently. For example, Leavitt [1965, p. 31] states that "different people perceive different things differently." One category of

this differential perception is what has been known as the "functional fixation" hypothesis discussed in Chapter III. That is, people continue to attach a specific meaning to some type of information even though the context of the presentation has changed.

This side of the human nature might be a deterrent to treating subjects as a homogeneous group. However, this problem does not seem to be a serious limitation here, since, as Zalkind and Castello [1969, pp. 213-14] indicate, the type of organization and one's place in it also provides a context within which perception takes place. Accordingly, it is the organization context, and not necessarily the subjects, that has to be homogeneous. In this study, the questionnaires were mailed to the subjects at their place of business and all the subjects worked in a similar-type organization--commercial banks. Furthermore, the analysis in Chapter VI showed no differences among subjects (assigned to different information levels) with respect to their personal attributes, especially risk preference and experience. Moreover, homogeneity of subjects in the strictest sense of the word is impossible. Thus, the relevant aspects of homogeneity must be determined in the context of the organization and the decision task. Since all respondents in this study perform the same task (evaluation of loan applications) at the same-type organization (commercial banks), relevant aspects of homogeneity appear to have prevailed and any differential perception has a very small chance of affecting the results obtained.

Finally, there is the traditional limitation relating to the differences between respondents and nonrespondents. The question that arises is: would the responses of nonrespondents have changed the results? Fortunately, this limitation and its impact can be evaluated statistically. There are two widely accepted methods for determining the existence or nonexistence of

nonresponse bias: (1) a comparison of the sample characteristics to known population characteristics, and (2) a comparison of the responses of early and late respondents. These two methods were used in this study. A comparison of three characteristics: (a) geographic location, (b) sex, and (c) percentage of officers who are members of a banking association, between the population of loan officers (from which the study sample was drawn), the sample, and the respondents revealed no significant differences in any of these characteristics. [See Appendix B, Table B-17]. A comparison of the decisions of respondents to the second request (who represent a portion of nonrespondents to the first mailing) with the decisions of early respondents also revealed no significant differences.⁵ Furthermore, a comparison of the results of this research with those of the pretest pilot study revealed no significant differences. This cross validation of the results may be an indication of the absence of nonresponse bias in this study.

B. Limitations Related to Research Design

One important limitation related to the research design is requesting subjects to quantify their judgments. As indicated in Chapter III, in evaluating loan applications, loan officers usually make their decisions on ordinal scales such as: high-average-low, or good-average-bad, or may be accept-reject. Thus, requesting them to quantify their decisions on an interval scale may not be conducive to obtaining the best possible decisions. However, ordinal scales were not used in this research because they are not

⁵ It was interesting to note that the time taken by late respondents (an average of 1 1/4 hours) was significantly longer than that taken by early respondents (an average of 3/4 hour). This may be due to the fact that respondents who usually take longer time to complete a task similar to the one requested in this research may tend to delay their responses until such time is available to them or until they are requested a second time. The lending decisions were, however, not significantly different from those of early respondents as indicated above.

amenable to statistical analysis. Also, interval scales may be readily converted to ordinal, but the reverse may not be true. Furthermore, there is no 'cost' of an incorrect response in case of ordinal decisions. Frishkoff [1982, p. 7] considers this the greatest weakness of not only questionnaires, but also interview and laboratory studies that ask for ordinal decisions. In a less artificial setting, the respondent has to allocate at least time (such as in this study) when he is asked to workout a quantity decision.

Another important limitation related to the research design is the use of one company and one industry rather than at least 2 companies or perhaps 4 companies from 2 different industries. As indicated in Chapter V, it was originally planned to use 2 companies in this study but as a result of pretesting the questionnaire with 2 companies, the average time taken by loan officers was found to be too long (1 hour and 25 minutes). It was felt that this relatively long time will drastically reduce the response rate, thus one company was dropped, and the sample was completely randomized with no restriction. Nevertheless, using 2 companies or different industries may lead to different results. Such a limitation can only be resolved, however, by replication of the research.

A third limitation of research design relates to the objective of the study which aims at determining decision effects. It may be argued, for example, that in case there are different decisions, no one really knows what caused those differences. That is, there is a "black box" between the input (the information given to the decision maker) and the output (the decisions made by the decision maker). If, however, the decision maker were to be observed over a period of time as he is making his decisions, one may be able to know what factors or pieces of information he used in making

those decisions and how he made those decisions. This may not be a serious limitation of this study, however, since the observation of decision makers in operation is only one approach of research and not necessarily the only nor the best one. (It is also more expensive and time consuming). Furthermore, the complete randomization of the sample should make the differences between the decision models (black boxes) of the decision makers not significantly different from zero. Moreover, the subjects in this study were asked to indicate the factors or pieces of information they used in making their decisions.⁶

A final and familiar limitation concerns the generalizability of the conclusions drawn in this study to other decision situations. It should not be overemphasized that the conclusions drawn here may not be carried over to other decision situations, e.g., investment decisions.⁷

⁶Furthermore, artificial responses (those that are not based on data analysis) are most likely to be inconsistent. Few such inconsistent responses were found and were dropped from the analysis.

⁷Placing Note No. 9 on inflation effects at the end of all supplementary notes may be considered an additional limitation. That is, it may be argued that it is not known whether BLOs made their decisions before or after reaching that last note. Thus, it is suggested that that note should have been placed sometimes at the beginning, sometimes in the middle, and sometimes at the end of supplementary notes. However, had this been done, it would have introduced two different limitations: (1) the annual report used would not have been representative of those of real life companies since almost all such companies place the note on inflation effects at the end of all notes, and (2) each of the 6 treatment groups would have been divided into 3 increasing the number to 18 which would have drastically reduced the number of responses per cell. Furthermore, the research design, as implemented, allowed half the treatment groups (those receiving the second presentation mode) to be aware of the existence of Note No. 9 since a reference was made to it on the face of the income statement (the first page of the annual report). Moreover, there is an indication that the other treatment groups did, in fact, review Note No. 9 (since they took significantly more time than that taken by the control group) and that they made their decisions after, not before, reviewing Note No. 9 (since the more time they took in data analysis, the more unfavorable their decisions were).

Recommendations for Further Research

One recommendation for further research is the use of the annual reports of 2 companies to be mailed to the same decision maker to avoid, beyond any doubt, the possible effects of different decision models on decisions. However, when this recommendation is implemented, ways must be found to increase the response rate, e.g., securing not only the endorsement but the sponsorship of a well-known organization such as the FASB or RMA; or perhaps offering to pay for the cost of the time lost to the bankers participating. A related recommendation is the use of two or more different industries to determine whether or not the results of this study would be confirmed.

Another recommendation is the use of the observation approach or the protocol analysis methodology (discussed in Chapter III) to determine what information is used by loan officers and whether SFAS 33 data are part of that information, and how exactly the decisions are made. It must be kept in mind, however, that the observation approach and protocol analysis are rather expensive tools of research.

An obvious recommendation is the replication of the study using different subjects, most importantly investors.

After time series data are accumulated, perhaps a study can be conducted to determine whether SFAS 33 data is useful in the prediction of business failure or any other event or object of interest such as future income or future cash flow.

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APPENDIX A
COPIES OF THE QUESTIONNAIRE PACKAGES

209

APPENDIX A-1
COVERING LETTER FROM THE CHAIRMAN OF DISSERTATION COMMITTEE
URGING LOAN OFFICERS' COOPERATION

DEPARTMENT OF ACCOUNTANCY

January 18, 1982

Dear Bank Loan Officer:

The enclosed financial data and related questionnaire are of critical importance to Mr. M. Maksy's doctoral dissertation. At the same time the results of this research will be of immediate practical value to banking in general and to lending officers, such as yourself, in particular.

By completing the questionnaire you would provide greatly needed and appreciated help to this student's research into a vitally important area of lending decision making and at the same time perform a service to your profession.

Every effort was made to make the minimum possible demands on your valuable time. We shall be grateful for your cooperation.

Sincerely,

Leopold A. Bernstein, Ph.D., CPA
Professor
Chairman of the Dissertation
Committee

LAB/jat

Enclosure

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APPENDIX A-2

210

COVERING LETTER FROM THE RESEARCHER SPECIFYING RESEARCH
OBJECTIVE, RESPONSE DATE AND OFFERING AN INCENTIVE TO RESPOND

DEPT. OF ACCOUNTANCY

January 18, 1982

ACCOUNTING INFORMATION AND BANK LENDING DECISIONS:
A RESEARCH STUDY

Although bankers are generally known to use accounting information in making lending decisions, accountants know relatively little about the effect of specific sets of accounting information on such decisions. The objective of this research is to discover ways in which accounting information can be made more responsive to the needs of bank loan and credit officers and to obtain some ideas about the relevance of certain accounting information to the decision making process of lenders.

Because this study will be based on statistical analysis, a large number of responses is needed. Since the study is limited to a select sample of individuals, the validity of this research and the value of its implications for bankers depend heavily on your cooperation. I would appreciate it very much if you respond by 2/19/1982 so that I may avoid mailing you a second request. Please be assured that your responses will be completely confidential; I am interested only in aggregate responses of all participants.

Upon completion of this research, the results will be submitted to Robert Morris Associates for publication in the Journal of Commercial Bank Lending. If you wish an advance copy of the results to be forwarded to you please check the box at the end of the questionnaire and print your name and address. A postage-free, self-addressed envelope is enclosed for your reply. Your prompt response is earnestly solicited and thank you very much in advance for your anticipated cooperation.

Sincerely,


M. E. Maksy,
Ph. D. Candidate &
Instructor of Accounting

Enclosures

MEM/fm

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211

APPENDIX A-3
SECOND REQUEST FROM THE RESEARCHER

DEPT. OF ACCOUNTANCY

March 1, 1982

I would like to ask again for your cooperation in a research project concerning accounting information and bank lending decisions. My first request was dated January 18, 1982. Although bankers are generally known to use accounting information in making lending decisions, accountants' knowledge about the effect of specific sets of accounting information on bank lending decisions is meager. The objective of this research is to discover ways in which accounting information can be made more responsive to the needs of bank loan and credit officers.

Because the study is based on statistical analysis, a large number of responses is needed. Since the study is limited to a select group of individuals, your response is vital to the success of the study, and I sincerely hope you will take the short time necessary to complete the questionnaire. Please be assured that individual responses will be kept strictly confidential and only aggregate responses will be published. As a token of my appreciation of your cooperation, I will mail you a copy of the findings of this research if you so desire. In view of the shortness of time for completing the study, I would appreciate it very much if you respond by March 19, 1982.

With many thanks.

Sincerely,

M. E. Maksy,
Ph.D. Candidate &
Instructor of Accounting

MEM/fm

THE QUESTIONNAIRE

APPENDIX A-4: QUESTIONNAIRE MAILED TO ALL GROUPS

[Note: The questionnaire mailed to the Control Group (No. 1) did not include supplementary Note No. 9 "Inflation Effects" in Question No. 8]

Serial No. _____

Introduction:

Company A has applied to your bank for an unsecured commercial loan. The firm is a new prospective customer who could eventually establish a long-run relationship with your bank.

The data shown on the enclosed financial statements are taken from the audited annual report of an actual corporation operating in the line of business indicated on the statements.

For the purpose of this research, please assume that:

- (1) this application is the only one pending in your files;
- (2) loanable funds in your bank are scarce; you may recommend anywhere from zero to the requested amount;
- (3) the loan's purpose will not violate any of your bank's policy restrictions;
- (4) the management of the firm expects past trends of the results of operations to continue into the near future;
- (5) the firm's management has unquestionable integrity and a good track record; and
- (6) loan repayment is expected to be made in a single payment from funds generated by continued normal operations.

After reading the above introduction, please review the financial statements and supplementary notes, then answer the few questions below.

The Questions:

- Q.1** Assuming that the firm is requesting a \$15 million loan for 6 months to finance its inventory:
(Please answer only part (a) or part (b): answer (a) if the loan is within your bank's lending limit and (b) if it is not)
- (a) If the loan is within your bank's legal limit, how much would you recommend for the firm at what increment above the prime interest rate?
\$ _____ at _____% above the prime rate.
- (b) If the loan exceeds your bank's legal limit, how much of a participation or a share (with other banks) would you accept at what increment above the prime interest rate?
\$ _____ at _____% above the prime rate.
- Q.2** In your judgment, what are the chances that the company will default on a 6-month loan?
(Please make your estimates on a scale from 0%-100%)
_____ %
- Q.3** In your judgment, what are the chances that the company will be a good credit risk over the next 3 years?
(Please make your estimates on a scale from 0%-100%)
_____ %
- Q.4** Assuming that, instead of a 6-month loan to finance inventory, the firm is requesting a \$15 million loan, on a 3-year unsecured note, to purchase equipment:
(Please answer only part (a) or part (b): answer (a) if the loan is within your bank's lending limit and (b) if it is not)
- (a) If the loan is within your bank's legal limit, how much would you recommend at what increment above the prime rate?
\$ _____ at _____% above the prime rate.
- (b) If the loan exceeds your bank's legal limit, how much of a participation or a share would you accept at what increment above the prime rate?
\$ _____ at _____% above the prime rate.

Q.5 In your judgment, what are the chances that the company will default on a 3-year unsecured note?
(Please make your estimates on a scale from 0%-100%)

_____ %

Q.6 Regarding all your decisions above, what are the most important factors or pieces of information you have considered in making those decisions? (Please rank in order of importance)

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____

Q.7 What additional informations would you have liked to have in these financial statements which are not presently here?

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____

Q.8 The financial statements of the company included various supplementary notes. How much did each of these notes help you in making your decisions?

(Please circle one number for each note)

	Not Helpful	1	2	3	4	5	Very Helpful
1. Principles of Consolidation	1	2	3	4	5		
2. Inventories	1	2	3	4	5		
3. Property, Plant & Equipment	1	2	3	4	5		
4. Income Taxes	1	2	3	4	5		
5. Long-term Debt	1	2	3	4	5		
6. Pension Plans	1	2	3	4	5		
7. Leases	1	2	3	4	5		
8. Quarterly Results	1	2	3	4	5		
9. Inflation Effects	1	2	3	4	5		

was not included for the
Control Group [No. 1]

Q.9 In your judgment, which of the following ranges would you consider to include an acceptable annual average percentage of dollar losses on total commercial loans? (Please check one)

_____ a. 0% - .5%

_____ b. .51% - 1%

_____ c. 1.01% - 1.5%

_____ d. 1.51 - 2%

_____ e. 2.01 - 2.5%

_____ f. Over 2.5%

Q.10 It would help us to classify your answers statistically if you could give us the following data concerning your background:

a. Approximate number of years engaged in evaluating commercial loan applications:

_____ years.

b. Approximate number of commercial loans evaluated in a "typical" week: _____ loans.

c. Your title and position at the bank: _____

d. Are you a member of a professional banking association?

[] No. [] Yes. Please indicate which: _____

e. Regardless of experience, there is much individual variation in the time spent in processing loan applications. Please indicate how long it took you to analyze the data and respond to the above questions:

hours _____; minutes _____.

END OF QUESTIONS; THANK YOU:

Please mail your responses back as soon as you can. If you are requesting (by checking the box below) a copy of the results of this research, you may wish to keep the annual report to refer to it when I mail you the results. Otherwise, you may dispose of it.

[] Yes, I'd like a copy of the results of this research.

Name: _____

Address: _____

APPENDIX A-5: ANNUAL REPORT MAILED TO GROUP NO. 7

[NOTE: The annual reports mailed to Groups 1 through 6 differed from that mailed to Group No. 7 as follows:

1. The annual report mailed to the Control Group (No. 1) neither included the supplementary Note No. 9 nor any reference to it on the face of the income statement.
2. The annual report mailed to Group No. 2 neither included the parts marked for Groups 3 & 6 nor any reference to Note No. 9 on the face of the income statement.
3. The annual report mailed to Group No. 3 neither included the parts marked for Groups 2 & 5 nor any reference to Note No. 9 on the face of the income statement.
4. The annual report mailed to Group No. 4 was identical to that mailed to Group No. 7 except that it did not include any reference to Note No. 9 on the face of the income statement.
5. The annual report mailed to Group No. 5 did not include any parts marked for Group No. 6.
6. The annual report mailed to Group No. 6 did not include any parts marked for Group No. 5.

Company A

1981 Annual Report

217

APPENDIX A-5 : ANNUAL REPORT MAILED TO GROUP NO. 7

Nature of Business:

Manufacturing and distribution of temperature and pressure automatic controls; energy absorption and transmission products; and other related products for transportation, appliances, and industrial processes and systems.

Statement of Consolidated Income and Retained Earnings (In thousands of dollars, except per share data) For Year Ended December 31

					Group 5 ↓	Group 6 ↓
	1979	1980	1981	%	1981 Adjusted for General Inflation See (Note 9)	1981 Adjusted for Changes in Specific Prices (Note 9)
Sales and Other Revenues	\$ 251,637	286,185	318,769	100.0	318,769	318,769
Cost of Sales	176,860	198,372	238,677	74.9	246,917	245,163
Gross Profit	\$ 74,777	87,793	80,092	25.1	71,852	73,606
Less:						
Selling & Admin. Expenses	47,176	52,363	56,191	17.6	56,191	56,191
Depreciation & Amortization	7,475	9,519	10,778	3.4	16,769	18,746
Interest Expense	4,008	4,372	4,862	1.5	4,862	4,862
	\$ 58,659	66,254	71,831	22.5	77,822	79,799
Income Before Taxes	\$ 16,118	21,539	8,261	2.6	(5,970)	(6,193)
Income Tax Expense	6,984	10,470	2,695	.8	2,695	2,695
Net Income	\$ 9,134	11,069	5,566	1.8	(8,665)	(8,888)
Retained Earnings 1/1	59,979	66,560	74,671			
	69,113	77,628	80,237			
Less: Cash Dividends	2,553	2,958	3,440			
Retained Earnings 12/31	66,560	74,671	76,797			
Average No. of Shares	1,656	1,687	1,732		1,732	1,732
Earnings Per Share	\$5.52	\$6.56	\$3.21		\$(5.00)	\$(5.13)
Dividends Per Share	\$1.53	\$1.74	\$1.95		\$1.95	\$1.95

All financial statements and supplementary notes are audited.

Income tax payments are approved through the end of 1980.

There are no unsatisfied judgements.

There are no legal suits pending.

Consolidated Balance Sheet (000's Omitted)
At December 31

		1979	1980	1981	%
ASSETS					
Current Assets:					
Cash & Marketable Securities	\$	8,137	2,758	7,355	3.7
Receivables		34,697	42,559	43,175	21.7
Inventories		55,100	66,583	63,210	31.8
Prepaid Expenses		5,941	6,522	5,143	2.6
Total Current Assets	\$	103,875	118,422	118,883	59.8
Property, Plant & Equipment, net	\$	55,333	61,644	58,675	29.5
Other Assets (Mostly Investments in Subsidiaries)		16,952	16,313	21,165	10.7
TOTAL ASSETS	\$	176,160	196,379	198,723	100.0
LIABILITIES & EQUITY					
Current Liabilities:					
Notes Payable - Banks	\$	2,262	3,318	801	.4
Accounts Payable		11,650	19,658	14,926	7.5
Accrued Liabilities		18,105	19,190	17,843	9.0
Current Maturities of Long-term Debt		801	3,592	4,317	2.2
Total Current Liabilities	\$	32,818	45,758	37,887	19.1
Long-term Debt		47,534	45,273	51,972	26.2
Deferred Income Taxes		3,711	4,481	5,045	2.5
Shareholders' Equity:					
Common Stock, \$12.50 par		20,865	21,307	21,994	11.1
Additional Paid-in Capital		4,672	4,889	5,028	2.5
Retained Earnings		66,560	74,671	76,797	38.6
Total Shareholders' Equity	\$	92,097	100,867	103,819	52.2
TOTAL LIABILITIES & EQUITY	\$	176,160	196,379	198,723	100.0

Statement of Changes in Consolidated Financial Position
(000's Omitted)

Year Ended December 31

	1979	1980	1981	%
Sources of Funds:				
From Operations:				
Net Income \$	9,134	11,069	5,566	22.8
<u>Add-back: Expenses Not Requiring the Use of Funds:</u>				
Depreciation & Amortization	7,475	9,519	10,778	44.1
Deferred Income Taxes	1,879	770	564	2.3
 Total From Operations \$	<u>18,488</u>	<u>21,358</u>	<u>16,908</u>	<u>69.2</u>
Increase in Capital Stock	608	659	826	3.4
Increase in Long-term Debt	4,798	0	6,699	27.4
 Total Sources of Funds \$	<u>23,894</u>	<u>22,017</u>	<u>24,433</u>	<u>100.0</u>
 Applications of Funds:				
Additions to Property, Plant & Equipment	18,268	15,830	10,409	42.6
Payment of Cash Dividends	2,553	2,958	3,440	14.1
Reduction of Long-term Debt	0	2,281	0	0
Other, net	1,820	(639)	2,252	9.2
 Total Applications of Funds	<u>22,641</u>	<u>20,410</u>	<u>16,101</u>	<u>65.9</u>
 Increase in Working Capital \$	<u>1,253</u>	<u>1,607</u>	<u>8,332</u>	<u>34.1</u>
 <u>Changes in Components of Working Capital:</u>				
Increase (Decrease) in Current Assets:				
Cash & Marketable Securities \$	(6,351)	(5,379)	4,597	
Receivables	6,718	7,862	616	
Inventories	3,160	11,483	(3,373)	
Prepaid Expenses	1,735	581	(1,379)	
\$	<u>5,262</u>	<u>14,547</u>	<u>461</u>	
Increase (Decrease) in Current Liabilities:				
Notes Payable - Banks \$	1,147	1,056	(2,517)	
Accounts Payable	1,998	8,008	(4,732)	
Accrued Liabilities	176	1,085	(1,347)	
Current Maturities of Long-term Debt	688	2,791	725	
	<u>4,009</u>	<u>12,940</u>	<u>(7,871)</u>	
 Increase in Working Capital \$	<u>1,253</u>	<u>1,607</u>	<u>8,332</u>	

Supplementary Notes to the Financial Statements: (000's Omitted)

1. Principles of Consolidation

Consolidated financial statements include company and wholly-owned subsidiaries. The equity method is used for investments in unconsolidated subsidiaries.

2. Inventories

Inventories are stated at the lower of cost (generally first-in, first-out) or market. Following is a breakdown of inventories:

		<u>1979</u>	<u>1980</u>	<u>1981</u>
Raw materials and supplies	\$	13,234	15,281	14,904
Work in Process		20,276	21,561	21,682
Finished goods		21,590	29,741	26,624
Total	\$	<u>55,100</u>	<u>66,583</u>	<u>63,210</u>

3. Property, Plant & Equipment

The company uses straight-line method of depreciation for financial reporting and accelerated depreciation for tax purposes.

Following are the details of property, plant, and equipment, net:

		<u>1979</u>	<u>1980</u>	<u>1981</u>
Property, Plant & Equipment:				
Buildings	\$	32,352	34,146	36,174
Machinery & Equipment		88,793	100,567	106,130
		<u>121,145</u>	<u>134,713</u>	<u>142,304</u>
Less: Accumulated Depreciation		67,867	74,700	85,828
		<u>53,278</u>	<u>60,013</u>	<u>56,476</u>
Land		2,055	1,631	2,199
Property, Plant & Equipment, net	\$	<u>55,333</u>	<u>61,644</u>	<u>58,675</u>

4. Income Taxes

The provisions for income taxes were comprised of the following:

		<u>1979</u>	<u>1980</u>	<u>1981</u>
Current:				
Federal and Foreign	\$	3,932	8,153	1,955
State and Local		1,173	1,547	176
Sub-total	\$	<u>5,105</u>	<u>9,700</u>	<u>2,131</u>
Deferred:		1,879	770	564
Total	\$	<u>6,984</u>	<u>10,470</u>	<u>2,695</u>

The differences between effective tax rates and the U.S. Federal tax rates are due primarily to state and local taxes, foreign rates different from U.S. rates, and the investment tax credit.

5. Long-term Debt

		<u>December 31</u>		
		<u>1979</u>	<u>1980</u>	<u>1981</u>
8.875% notes payable, maturing through January 15, 1993	\$	32,500	30,000	27,500
7.25% notes payable, maturing through June 1, 2001		5,580	5,480	9,760
5% notes payable, maturing through May 1, 1989		7,000	7,000	7,000
Notes payable to banks (weighted average interest of 14.8%) maturing in 1983		0	3,000	7,365
Capitalized lease obligations (weighted average interest of 8.3%) maturing through 1998		2,317	2,950	2,865
Other		958	455	1,799
Sub-total	\$	<u>48,335</u>	<u>48,885</u>	<u>56,289</u>
Less: Current maturities		<u>801</u>	<u>3,592</u>	<u>4,317</u>
Total	\$	<u>47,534</u>	<u>45,273</u>	<u>51,972</u>

Debt retirements in the next five years are as follows:

1982: \$4,317; 1983: \$5,149; 1984: \$6,743; 1985: \$4,608; 1986: \$3,455; Thereafter: \$32,017; Less: Current Maturities of \$4,317 = \$51,972.

6. Pension Plans

The company and its subsidiaries have several pension plans covering substantially all employees. Pension expense for the year, including amortization of past service cost was \$7,230 (\$7,030 in 1980). The company's policy is to fund pension expense accrued. Based upon the latest actuarial valuation reports, the unfunded vested benefits and unfunded prior service cost were approximately \$23,300 and \$38,600 respectively.

7. Leases

The company leases certain real estate and equipment. Future minimum lease payments (principal and interest), by year and in the aggregate under capitalized leases (payments for operating leases are not material) consisted of the following at December 31, 1981:

1982: \$661; 1983: \$439; 1984: \$423; 1985: \$378; 1986: \$259; Thereafter: \$898;

Total minimum lease payments:	\$3,058
Less: amounts representing interest	862
Present value of minimum payments	<u>\$2,196*</u>

*Reflected in the balance sheet as current maturities of and long-term debt of \$400 and \$1,796 respectively.

8. Quarterly Results of Operations

	<u>Three Months Ended</u>				
	<u>March 31</u>	<u>June 30</u>	<u>Sept. 30</u>	<u>Dec. 30</u>	<u>Total Year</u>
<u>1981</u>					
Net Sales	\$81,474	\$84,992	\$78,729	\$73,574	\$318,769
Gross Profit	21,276	19,683	18,052	21,081	80,092
Net Income	2,306	1,672	229	1,359	5,566
Earnings Per Share	\$1.34	\$.96	\$.12	\$.79	\$3.21
<u>1980</u>					
Net Sales	\$67,448	\$78,720	\$67,150	\$72,847	\$286,165
Gross Profit	19,122	25,185	20,653	22,833	87,793
Net Income	2,170	3,883	2,241	2,775	11,069
Earnings Per Share	\$1.29	\$2.30	\$1.32	\$1.65	\$6.56

9. Inflation Effects

As required by the Statement of Financial Accounting Standards No. 33, the following statements have been adjusted to reflect general inflation (constant dollar) and changes in specific prices (current cost) information $\rightarrow$ G3+6

Groups 2 & 5

Groups 3 & 6

Inventories, property, plant & equipment, cost of sales, and depreciation expense have been recalculated for the general inflation using the average of the Consumer Price Index for all Urban consumers (CPI-U).

Groups
2 & 5

The current cost (CC) amounts for inventories were approximated using current prices for major raw materials, indices of prices for other raw materials and supplies, and current labor and overhead rates. CC of sales has been adjusted for the restated inventories.

CC of land was determined by reference to real estate tax assessments. CC of buildings, machinery, and equipment and the related accumulated depreciation have been determined by applying published indices of construction costs to the historical cost of the assets.

Groups
3 & 6

CC depreciation is based on the average CC of properties during the year. The depreciation methods, salvage values and useful lives are the same as those used in preparing the primary financial statements.

The data as adjusted for changing prices should not be thought of as precise measurements of the assets and expenses involved, but instead represent reasonable approximations of the price changes that have occurred in the business environment in which the company operates.

Statement of Consolidated Income Adjusted for Changing Prices
Year Ended December 31, 1981
(In Thousands of Dollars, Except Per Share Data)

	As Reported in the Primary Financial Statements	Groups 2 & 5 Adjusted for General Inflation (Constant Dollars)	Groups 3 & 6 Adjusted for Changes in Specific Prices (Current Costs)
Net Sales and Other Revenues	\$ 318,769	\$ 318,769	\$ 318,769
Cost of Sales	238,677	246,917	245,163
Depreciation and Amortization	10,778	16,769	18,746
Other Operating Expenses	56,191	56,191	56,191
Interest Expense	4,862	4,862	4,862
	<u>310,508</u>	<u>324,739</u>	<u>324,962</u>
Income Before Taxes	8,261	(5,970)	(6,193)
Income Tax Expense	2,695	2,695	2,695
Net Income	<u>\$ 5,566</u>	<u>(8,665)</u>	<u>(8,888)</u>
Earnings Per Share	<u>\$ 3.21</u>	<u>\$ (5.00)</u>	<u>\$ (5.13)</u>
Purchasing power gain from holding net monetary liabilities during the year		\$ 3,596	\$ 3,596
Increase in specific prices (current costs) of inventories, and property, plant & equipment held during year*			24,801
Less: Effect of increase in the general price level (CPI-U)			<u>24,300</u>
Increase in current costs of inventories and properties, net of increase in the general price level			<u>\$ 501</u>
*At December 31, 1981, current cost of inventories was \$64,980 (historical amount: \$63,210), and current cost of property, plant, and equipment, net of accumulated depreciation, was \$126,247 (historical amount: \$58,675).			

**Five-Year Comparison of Selected Supplementary Financial Data
Adjusted for the Effects of Changing Prices
- (In Average 1981 Dollars, Except "As Reported" Amounts)
(In Thousands of Dollars, Except Per Share Data)**

	<u>Year Ended December 31</u>				
	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
<u>Net Sales & Other Revenues:</u>					
As Reported	202,890	231,315	251,637	286,165	318,769
Adjusted for General Inflation	273,625	294,944	301,410	318,384	318,769
<u>Income (Loss) from Continuing Operations:</u>					
As Reported				11,069	5,566
Adjusted for General Inflation			Groups 2 & 5	(3,181)	(8,665)
Adjusted for Specific Price Changes			Groups 3 & 6	(3,203)	(8,888)
<u>Income (Loss) from Continuing Operations Per Common Share:</u>					
As Reported				6.56	3.21
Adjusted for General Inflation			Groups 2 & 5	(1.89)	(5.00)
Adjusted for Specific Price Changes			Groups 3 & 6	(1.90)	(5.13)
<u>Purchasing Power Gain from Holding Net Monetary Liabilities During the Year</u>				4,495	3,592
<u>Increase in Current Cost of Inventories and Properties, Net of Increase in the General Price Level</u>			Groups 3 & 6	1,047	501
<u>Net Assets At Year-End:</u>					
As Reported				100,867	103,819
Adjusted for General Inflation			Groups 2 & 5	179,174	153,319
Adjusted for Specific Price Changes			Groups 3 & 6	197,676	163,992
<u>Cash Dividends Declared Per Common Share:</u>					
As Reported	1.28	1.32	1.53	1.74	1.95
Adjusted for General Inflation	1.73	1.68	1.83	1.94	1.95
<u>Market Price Per Common Share At Year-End:</u>					
As Reported					
Adjusted for General Inflation	18%	23½	25%	26%	23
	22%	30	30%	29%	22%
<u>Average Consumer Price Index for All Urban Consumers (1967 = 100)</u>	161.2	170.5	181.5	195.4	217.4

APPENDIX B
ANALYSIS OF RESPONDENTS

225

Table B-1

CATEGORIZATION OF SUBJECTS BY STATE, NUMBER OF CITIES, AND NUMBER OF BANKS

QUESTIONNAIRES MAILED*											R E S P O N S E S*											RR
State	No. of Cities	No. of Banks	Group Number							Total	State	No. of Cities	No. of Banks	Group Number							Total	
			1	2	3	4	5	6	7					1	2	3	4	5	6	7		
AL	5	9	5	4	3	4	1	2	2	21	AL	2	2	1	2	0	0	0	0	0	3	14
AK	1	1	0	0	2	0	1	0	0	3	AK	0	0	0	0	0	0	0	0	0	0	00
AZ	1	2	2	3	5	1	3	7	4	25	AZ	1	2	1	2	1	0	2	2	2	10	40
CA	5	7	1	4	2	3	2	0	3	15	CA	4	4	1	1	1	1	0	1	6	40	
CO	1	3	2	4	2	3	1	0	2	14	CO	1	2	1	1	0	1	1	0	0	4	29
CT	4	5	3	3	2	1	3	0	1	13	CT	4	4	0	1	0	1	3	0	0	5	38
DE	1	2	1	1	0	0	3	0	0	5	DE	1	1	0	0	0	0	1	0	0	1	20
DC	1	2	2	0	0	0	0	0	2	4	DC	0	0	0	0	0	0	0	0	0	0	00
FL	12	15	3	5	2	4	7	5	3	29	FL	4	6	0	1	1	3	1	2	0	8	28
GA	1	2	3	0	2	1	3	1	2	12	GA	1	2	2	0	0	1	3	0	0	6	50
HI	1	2	0	0	0	1	1	0	0	2	HI	0	0	0	0	0	0	0	0	0	0	00
ID	1	2	0	2	1	0	0	0	0	4	ID	0	0	0	0	0	0	0	0	0	0	00
IL	2	11	13	9	18	10	3	14	14	81	IL	1	7	2	2	4	3	0	5	6	22	27
IN	6	9	2	4	3	5	6	3	4	27	IN	4	6	0	0	0	2	3	1	2	8	30
IA	2	3	1	1	3	1	1	2	0	9	IA	2	3	0	1	0	1	0	1	0	3	33
KS	1	2	1	0	1	1	1	0	1	5	KS	1	2	1	0	1	1	0	0	0	3	60
KY	2	3	1	1	1	5	2	1	2	13	KY	2	3	1	0	0	3	1	0	1	6	46
LA	5	9	3	3	6	5	3	2	4	26	LA	4	6	3	0	1	3	0	0	1	8	31
ME	1	2	2	1	0	1	0	2	2	8	ME	1	2	0	1	0	0	0	2	1	4	50
MD	1	4	2	4	0	4	5	4	4	23	MD	1	4	1	2	0	1	1	1	1	7	30
MA	6	10	7	7	4	7	8	3	7	43	MA	3	5	1	3	1	2	2	0	0	9	21
MI	8	15	13	18	8	13	11	13	12	88	MI	6	11	6	5	1	3	3	2	4	24	27
MN	2	5	4	4	3	1	5	4	1	22	MN	2	3	2	0	2	0	4	0	0	8	36
MS	2	2	2	0	2	0	0	0	1	5	MS	1	1	1	0	0	0	0	0	0	1	20
MO	2	5	5	3	7	4	6	2	3	30	MO	1	2	0	0	2	0	0	0	0	2	7
NE	1	1	1	2	0	0	2	0	1	6	NE	1	1	1	0	0	0	0	0	1	2	33
NV	1	1	0	0	0	0	1	0	0	1	NV	0	0	0	0	0	0	0	0	0	0	00
NJ	14	16	7	8	5	12	7	7	6	52	NJ	4	7	1	3	1	2	0	2	0	9	17
NM	1	1	2	1	0	1	0	0	0	4	NM	1	1	0	1	0	0	0	0	0	1	25
NY	5	18	10	10	14	9	9	13	7	72	NY	2	11	4	4	3	3	2	6	1	23	32
NC	4	7	1	3	6	5	1	3	2	21	NC	4	4	0	2	2	0	1	2	1	8	38
OH	6	14	11	7	10	8	10	7	6	59	OH	6	10	2	3	5	3	3	2	1	19	32
OK	2	5	4	5	1	1	2	3	4	20	OK	2	3	1	1	0	0	1	0	0	3	15
PA	9	17	14	15	13	10	13	17	11	99	PA	5	12	7	5	4	2	4	1	3	26	28
RI	1	1	0	1	0	1	1	1	1	5	RI	1	1	0	1	0	0	0	0	0	1	20
SC	2	2	0	1	1	1	2	2	1	8	SC	2	2	0	0	0	1	2	0	0	3	38
TN	2	3	1	0	1	1	3	3	6	15	TN	2	2	0	0	0	0	0	1	2	3	20
TX	7	11	7	5	5	6	10	8	12	53	TX	6	9	2	2	2	1	4	3	5	19	36
WA	2	2	1	0	0	2	0	1	0	4	WA	1	1	0	0	0	1	0	0	0	1	25
WI	1	2	3	1	0	1	0	0	0	5	WI	1	1	1	0	0	0	0	0	0	1	20
40	132	233	140	140	133	133	137	130	132	945	35	85	143	43	44	32	39	43	33	33	267	28
RESPONSE RATE: % of Responses to Mailed											88	66	61	31	31	24	29	31	25	25	28	

*Net of questionnaires returned unfilled. See Tables B-2 and B-3 for categorization of these by reason given and by State respectively.

@ Response Rate by State.

Table B-2
CATEGORIZATION OF QUESTIONNAIRES RETURNED UNFILLED BY REASON GIVEN

Reason Mentioned	Group Number							Total	%
	1	2	3	4	5	6	7		
No longer with the bank (1)	2	5	7	7	4	7	4	36	.343
Completing one by our bank is enough (2)	2	1	3	5	3	4	4	22	.210
Not a commercial loan officer	2	0	1	1	3	4	3	14	.133
Did not receive the questionnaire (3)	2	0	2	3	1	3	3	14	.133
Have no time	0	2	4	1	2	0	1	10	.095
Away on extended illness or out of the country	1	2	0	0	0	1	1	5	.048
No reason given	0	0	0	0	0	1	2	3	.029
Have no experience for this size of loan	1	0	0	0	0	0	0	1	.009
TOTAL	10	10	17	17	13	20	18	105	1.000

- (1) The relatively large number of this category is probably due to the relatively long time lag between the date [June 1980] of constructing a portion of the population of loan officers [the portion constructed from Polk's Directory of Banks] from which the final sample was randomly selected and the date of mailing the questionnaires [January 1982]. Whether reconstructing that portion at a date closer to the mailing date would have significantly reduced that number cannot be determined. Because the largest portion of the population of loan officers was chosen from a more recent publication [RMA 1980-1981 membership roster] and because the other portion took 3 weeks of full time work to construct, the researcher decided that it is probably not worth while to reconstruct that portion.
- (2) The relatively large number of this category is probably due to multiple mailing to the same bank. This multiple mailing was unavoidable in this study because of the limited number of large banks in relation to the large size of the sample [240 banks versus 1,050 subjects]. This multiple mailing is not believed to have presented any serious bias for the reasons explained at the beginning of Chapter VI.
- (3) The numbers in this category were determined by the answers to the second request letter [to which no new questionnaire was attached] and to spot personal telephone calls by the researcher to some loan officers who did not respond until the expiration of the response date stated in the second request letter.

Table B-3

CATEGORIZATION OF QUESTIONNAIRES RETURNED UNFILLED
BY STATE, NUMBER OF CITIES, AND NUMBER OF BANKS

State	No. of Cities	No. of Banks	G R O U P N U M B E R							Total	Z*
			1	2	3	4	5	6	7		
AL	2	3	1	0	1	2	1	0	1	6	.222
AZ			0	1	0	0	0	0	0	1	.038
CT			1	0	1	0	0	0	0	2	.138
DE			1	0	0	0	0	1	0	2	.286
FL		1	1	1	3	2	2	0	3	12	.293
ID		1	0	2	0	0	2	0	1	5	.556
IL		1	0	3	2	2	1	2	3	13	.138
IN			0	0	1	0	0	0	0	1	.036
LA			0	1	0	0	0	1	0	2	.071
MD			1	0	2	0	0	0	1	4	.148
MA			1	0	1	2	2	6	2	14	.246
MI			0	0	2	3	0	1	0	6	.064
KS			0	0	0	0	0	0	1	1	.167
MN			1	0	0	0	0	0	1	2	.083
MO			0	0	1	0	1	1	0	3	.091
NJ			0	0	0	1	1	1	0	3	.055
NY			0	2	1	1	0	1	2	7	.089
OH			3	0	0	0	0	2	1	6	.092
PA			0	0	0	2	1	2	1	6	.060
SC			0	0	0	0	0	1	0	1	.111
TX		1	0	0	2	1	2	1	1	7	.117
VT ^a	1	1	0	0	0	1	0	0	0	1	1.000
Total	3	7	10	10	17	17	13	20	18	105	.100
Z**	.022	.029	.067	.067	.113	.113	.087	.133	.120	.100	← Z***

a Only one questionnaire was mailed to a bank in Burlington, Vermont, but that questionnaire was returned unfilled. Thus, the State of Vermont did not appear in Appendix B-1.

* Percentage to the number originally mailed by State.

** Percentage to the number originally mailed by group.

*** Percentage to the total number of questionnaires mailed to all States and all groups.

Table B-4

228

CATEGORIZATION OF RESPONDENTS BY RISK ATTITUDE

Risk Attitude Category	% of \$ Losses on Total Commercial Loans	G R O U P N U M B E R							Total	%
		1	2	3	4	5	6	7		
1	0% - .5%	21	30	14	16	19	20	16	136	50.9
2	.51% - 1.0%	16	9	9	15	17	11	10	87	32.6
3	1.01% - 1.5%	4	4	7	4	3	2	4	28	10.5
4	1.51% - 2.0%	2	0	1	1	3	0	2	9	3.4
5	2.01% - 2.5%	0	0	0	1	0	0	1	2	.7
6	Over 2.5%	0	0	0	1	0	0	0	1	.4
7	Missing Obser.	0	1	1	1	1	0	0	4	1.5
TOTALS		43	44	32	39	43	33	33	267	100.0

Table B-5

CATEGORIZATION OF RESPONDENTS BY EXPERIENCE

Experience Category	No. of Loans Evaluated in Past 5 Years	G R O U P N U M B E R							Total	%
		1	2	3	4	5	6	7		
1	Less Than 100	2	0	3	2	2	0	2	11	4.1
2	100 - 500	7	7	2	8	9	6	4	43	16.1
3	501 - 1000	6	7	3	4	2	2	6	30	11.2
4	1001 - 1500	7	7	3	5	6	6	6	40	15.0
5	1501 - 2000	4	5	3	7	4	2	1	26	9.7
6	2001 - 2500	3	3	7	5	7	5	3	33	12.4
7	2501 - 5000	8	8	5	5	8	4	2	40	15.0
8	Over 5000	4	1	4	2	1	5	4	21	7.9
9	Missing Obser.	2	6	2	1	4	3	5	23	8.6
TOTALS		43	44	32	39	43	33	33	267	100.0

Table B-6

FREQUENCY DISTRIBUTION OF RESPONDENTS BY RISK ATTITUDE (R) AND EXPERIENCE (E)

For the Control Group [No. 1]

R	E	Experience Category No.									Σ R
		1	2	3	4	5	6	7	8	9	
Risk Attitude Category No.	1	1	3	3	3	1	1	6	3		21
	2		3	2	2	2	2	2	1	2	16
	3	1		1	2						4
	4		1			1					2
	5										0
	6										0
	7										0
Σ E		2	7	6	7	4	3	8	4	2	43

Table B-7

FREQUENCY DISTRIBUTION OF RESPONDENTS
BY RISK ATTITUDE (R) AND EXPERIENCE (E)
For Group No. 2

R \ E		Experience Category No.									Σ R
		1	2	3	4	5	6	7	8	9	
Risk Attitude Category No.	1		3	7	7	2	2	3	1	5	30
	2		2			2		4		1	9
	3		2			1	1				4
	4										0
	5										0
	6										0
	7							1			1
Σ	E	0	7	7	7	5	3	8	1	6	44

Table B-8

FREQUENCY DISTRIBUTION OF RESPONDENTS
BY RISK ATTITUDE (R) AND EXPERIENCE (E)
For Group No. 3

R \ E		Experience Category No.									Σ R
		1	2	3	4	5	6	7	8	9	
Risk Attitude Category No.	1		1	2	2	1	4	2	1	1	14
	2	2	1	1		2	1		2		9
	3				1		1	3	1	1	7
	4	1									1
	5										0
	6										1
	7						1				1
Σ	E	3	2	3	3	3	7	5	4	2	32

Table B-9

FREQUENCY DISTRIBUTION OF RESPONDENTS
BY RISK ATTITUDE (R) AND EXPERIENCE (E)
For Group No. 4

R \ E		Experience Category No.									Σ R
		1	2	3	4	5	6	7	8	9	
Risk Attitude Category No.	1	1	1	1	2	5	3	2	1		16
	2		5	1	2	1	2	3	1		15
	3		1	1		1				1	4
	4	1									1
	5			1							1
	6				1						1
	7		1								1
Σ	E	2	8	4	5	7	5	5	2	1	39

Table B-10

FREQUENCY DISTRIBUTION OF RESPONDENTS
BY RISK ATTITUDE (R) AND EXPERIENCE (E)
For Group No. 5

R	E	Experience Category No.									Σ R
		1	2	3	4	5	6	7	8	9	
Risk Attitude Category No.	1	2	4		1	3	2	6	1		19
	2		4	1	5	1	2	2		2	17
	3						2			1	3
	4			1			1			1	3
	5										0
	6										0
	7		1								1
Σ E		2	9	2	6	4	7	8	1	4	43

Table B-11

FREQUENCY DISTRIBUTION OF RESPONDENTS
BY RISK ATTITUDE (R) AND EXPERIENCE (E)
For Group No. 6

R	E	Experience Category No.									Σ R
		1	2	3	4	5	6	7	8	9	
Risk Attitude Category No.	1		3	1	3	2	4	3	3	1	20
	2		2	1	3		1	1	2	1	11
	3		1							1	2
	4										0
	5										0
	6										0
	7										0
Σ E		0	6	2	6	2	5	4	5	3	33

Table B-12

FREQUENCY DISTRIBUTION OF RESPONDENTS
BY RISK ATTITUDE (R) AND EXPERIENCE (E)
For Group No. 7

R	E	Experience Category No.									Σ R
		1	2	3	4	5	6	7	8	9	
Risk Attitude Category No.	1		1	4	3		2		4	2	16
	2		2	2	2	1	1	2			10
	3		1		1					2	4
	4	1								1	2
	5	1									1
	6										0
	7										0
Σ E		2	4	6	6	1	3	2	4	5	33

Table B-13

CATEGORIZATION OF RESPONDENTS BY MEMBERSHIP
IN PROFESSIONAL BANKING ASSOCIATIONS

Member In	G R O U P N U M B E R							Total	%
	1	2	3	4	5	6	7		
Robert Morris Associates	28	30	20	19	25	20	23	165	61.8
American Institute of Banking	5	4	0	2	4	4	4	23	8.6
American Bankers Assoc.	3	3	1	3	0	2	2	14	5.3
National Association of Bank Women	2	1	1	1	1	0	2	8	3.0
Other Associations	2	2	1	3	2	1	0	11	4.1
Not a Member	9	10	11	15	14	8	7	74	27.7
Less: Members in More Than One Association	(6)	(6)	(2)	(4)	(3)	(2)	(5)	(28)	(10.5)
Totals	43	44	32	39	43	33	33	267	100.0

Table B-14

CATEGORIZATION OF SUBJECTS BY TITLE

Q U E S T I O N N A I R E S M A I L E D#									
Title	G R O U P N U M B E R							Total	%M*
	1	2	3	4	5	6	7		
Executive Vice President	6	11	4	9	7	4	11	52	5.5
Senior Vice President	19	19	22	13	15	17	22	127	13.5
Vice President	73	71	61	64	76	70	53	468	49.5
Assistant Vice President	20	20	20	20	24	16	23	143	15.1
Commercial Loan Officer	11	11	13	16	7	17	11	86	9.1
Assistant Cashier	2	2	2	2	2	1	3	14	1.5
Other	9	6	11	9	6	5	9	55	5.8
Totals	140	140	133	133	137	130	132	945	100.0

R E S P O N S E S R E C E I V E D#										%R	
Title	G R O U P N U M B E R							To- tal	RR @	%R**	Less %M
	1	2	3	4	5	6	7				
Executive Vice President	2	1	2	0	0	1	1	7	14	2.6	-.9
Senior Vice President	3	2	2	2	7	1	1	18	14	6.7	-6.8
Vice President	21	23	15	16	22	18	15	130	28	48.7	-0.8
Assistant Vice President	11	6	6	5	5	8	4	45	32	16.9	1.8
Commercial Loan Officer	3	5	3	9	7	4	6	37	43	13.9	4.8
Assistant Cashier	1	0	0	1	0	0	0	2	14	.7	-0.8
Other	2	7	4	6	2	1	6	28	49	10.5	4.7
Totals	43	44	32	39	43	33	33	267	28	100.0	0.0

* Percentage of questionnaires mailed to each title to total questionnaires mailed.

** Percentage of responses by each title to total responses received.

@ Response Rate by Title.

Net of questionnaires returned unfilled. See Tables B-2 and B-3 for analyses of these.

Table B-15
CATEGORIZATION OF SUBJECTS BY BANK SIZE

Deposits in \$- Millions	QUESTIONNAIRES MAILED										R E S P O N S E S												
	GROUP NUMBER								To- tal	ZM	GROUP NUMBER							T	ZR	RR*	ZR-ZM		
	1	2	3	4	5	6	7	1			2	3	4	5	6	7							
350- 500	14	16	13	17	17	14	11	102	10.8	4	7	1	6	5	4	3	30	11.2	29	0.4			
501- 700	17	19	26	27	20	14	23	146	15.4	2	3	6	12	3	2	7	35	13.1	24	-2.3			
701-1000	30	23	15	19	20	18	17	142	15.0	9	3	4	7	7	2	4	36	13.5	25	-1.5			
1001-1500	16	13	13	15	20	13	22	112	11.9	3	4	3	1	7	4	4	26	9.7	23	-2.2			
1501-2000	15	23	10	21	24	19	19	131	13.9	2	10	3	6	8	4	4	37	13.9	28	0.0			
2001-3500	12	20	13	13	19	18	13	108	11.4	6	9	2	0	4	6	4	31	11.6	29	0.2			
3501-7000	21	14	21	7	11	16	15	105	11.1	11	3	6	2	6	6	3	37	13.9	35	2.8			
Over 7000	15	12	22	14	6	18	12	99	10.5	6	5	7	5	3	5	4	35	13.1	35	2.6			
Totals	140	140	133	133	137	130	132	945	100.0	43	44	32	39	43	33	33	267	100.0	28	0.0			

*Response Rate by Size.

Table B-16
CATEGORIZATION OF SUBJECTS BY BANK ACTIVITY RATIO

Bank Activity Ratio	QUESTIONNAIRES MAILED										R E S P O N S E S												
	GROUP NUMBER								To- tal	ZM	GROUP NUMBER								T	ZR	RR*	ZR-ZM	
	1	2	3	4	5	6	7	1			2	3	4	5	6	7							
43%-59%	18	18	15	16	17	12	17	113	12.0	4	3	4	7	3	2	3	26	9.8	23	-2.2			
60%-69%	62	58	61	43	61	65	56	406	43.0	21	18	10	14	26	21	16	126	47.2	31	4.2			
70%-79%	44	51	40	53	53	41	47	329	34.8	13	19	12	14	14	6	11	89	33.3	27	-1.5			
80%-89%	12	11	9	17	5	11	7	72	7.6	4	4	3	3	0	4	1	19	7.1	26	-0.5			
90%-97%	4	2	8	4	1	1	5	25	2.6	1	0	3	1	0	0	2	7	2.6	28	0.0			
Totals	140	140	133	133	137	130	132	945	100.0	43	44	32	39	43	33	33	267	100.0	28	0.0			

* Response Rate By Activity Ratio.

Table B-17
RELATIONSHIPS AMONG RESPONDENTS, SAMPLE AND POPULATION OF LOAN OFFICERS
[Classified By Sex, RMA Membership and Geographic Location]

Classification Category	POPULATION		S A M P L E			R E S P O N D E N T S			
	No.	%P	No.	%S	%S-%P	No.	ZR	ZR-%P	ZR-%S
SEX:									
Men	2776	93.8	980	93.3	-0.5	254	95.1	1.3	1.8
Women	182	6.2	70	6.7	0.5	13	4.9	-1.3	-1.8
Totals	2958	100.0	1050	100.0	0.0	267	100.0	0.0	0.0
RMA MEMBERSHIP:									
RMA Members	1827	61.8	649	61.8	0.0	165	61.8	0.0	0.0
Other Associations'									
Members	*	*	*	*	[0.0]	28	10.5	[0.0]	[0.0]
Non-RMA Members	1131	38.2	401	38.2		74	27.7		
Totals	2958	100.0	1050	100.0	0.0	267	100.0	0.0	0.0

* Included in Non-RMA Members.

Table B-17 (Continued)

Classification Category	POPULATION		S A M P L E			R E S P O N D E N T S			
	No.	%P	No.	%S	%S-%P	No.	%R	%R-%P	%R-%S
GEOGRAPHIC LOCATION:									
Alabama	84	2.8	27	2.6	-0.2	3	1.1	-1.7	-1.5
Alaska	8	.3	3	.3	0.0	0	0.0	-0.3	-0.3
Arizona	53	1.8	26	2.5	0.7	10	3.7	1.9	1.2
California	38	1.3	15	1.4	0.1	6	2.2	0.9	0.8
Colorado	35	1.2	14	1.3	0.1	4	1.5	0.3	.2
Connecticut	44	1.5	15	1.4	-0.1	5	1.9	.4	.5
Delaware	22	.7	7	.7	0.0	1	.4	-0.3	-0.3
District of Columbia	18	.6	4	.4	-0.2	0	0.0	-0.6	-0.4
Florida	136	4.6	41	3.9	-0.7	8	3.0	-1.6	-0.9
Georgia	34	1.1	12	1.1	0.0	6	2.3	1.2	1.2
Hawaii	8	.3	2	.2	-0.1	0	0.0	-0.3	-0.2
Idaho	18	.6	9	.8	.2	0	0.0	-0.6	-0.8
Illinois	266	9.0	94	9.0	0.0	22	8.2	-0.8	-0.8
Indiana	87	2.9	28	2.7	-0.2	8	3.0	.1	.3
Iowa	26	.9	9	.8	-0.1	3	1.1	.2	.3
Kansas	20	.7	6	.6	-0.1	3	1.1	.4	.5
Kentucky	35	1.2	13	1.2	0.0	6	2.2	1.0	1.0
Louisiana	87	2.9	28	2.7	-0.2	8	3.0	.1	.3
Maine	22	.7	8	.8	.1	4	1.5	.8	.7
Maryland	85	2.9	27	2.6	-0.3	7	2.6	-0.3	0.0
Massachusetts	188	6.4	57	5.4	-1.0	9	3.4	-3.0	-2.0
Michigan	221	7.5	94	9.0	1.5	24	9.0	1.5	0.0
Minnesota	53	1.8	24	2.3	.5	8	3.0	1.2	.7
Mississippi	12	.4	5	.5	.1	1	.4	0.0	-0.1
Missouri	92	3.1	33	3.1	0.0	2	.8	-2.3	-2.3
Nebraska	22	.7	6	.6	-0.1	2	.8	.1	.2
Nevada	5	.2	1	.1	-0.1	0	0.0	-0.2	-0.1
New Jersey	156	5.3	55	5.2	-0.1	9	3.4	-1.9	-1.8
New Mexico	7	.2	4	.4	.2	1	.4	.2	0.0
New York	197	6.7	79	7.5	.8	23	8.6	1.9	1.1
North Carolina	64	2.2	21	2.0	-0.2	8	3.0	.8	1.0
Ohio	159	5.4	65	6.2	.8	19	7.1	1.7	.9
Oklahoma	48	1.8	20	1.9	.1	3	1.1	-0.7	-0.8
Pennsylvania	315	10.6	99	9.4	-1.2	26	9.7	-0.9	.3
Puerto Rico	2	.1	0	0.0	-0.1	0	0.0	-0.1	0.0
Rhode Island	15	.5	5	.5	0.0	1	.4	-0.1	-0.1
South Carolina	37	1.2	9	.8	-0.4	3	1.1	-0.1	.3
Tennessee	34	1.1	15	1.4	.3	3	1.1	0.0	-0.3
Texas	169	5.7	60	5.7	0.0	19	7.1	1.4	1.4
Vermont	5	.2	1	.1	-0.1	0	0.0	-0.2	-0.1
Washington	12	.4	4	.4	0.0	1	.4	0.0	0.0
Wisconsin	14	.5	4	.5	0.0	1	.4	-0.1	-0.1
Totals	2958	100.0	1050	100.0	0.0	267	100.0	0.0	0.0

KEY: %P= Percentage of each sex, membership, or State to total population.

%S= Percentage of each sex, membership, or State to total sample.

%R= Percentage of each sex, membership, or State to total respondents.

Table B-18

BANKS SURVEYED

[Arranged in Alphabetical Order by State, City and Name of Bank]

State	City	No.	Name of Bank
AL	Birmingham	1	Birmingham Trust National Bank**
		2	First National Bank of Birmingham
	Decatur	3	Central Bank of Alabama*
	Gadsden	4	Central Bank of Alabama**
	Huntsville	5	Central Bank of Alabama**
	Jasper	6	Central Bank of Walker County*
	Mobile	7	Central Bank of Mobile**
		8	First National Bank of Mobile**
	Montgomery	9	Merchants National Bank of Mobile**
		10	Central Bank of Montgomery
	Scottsboro	11	First Alabama Bank of Montgomery**
		12	Central Bank of Alabama**
AK	Anchorage	13	National Bank of Alaska**
AZ	Phoenix	14	The Arizona Bank
		15	First Interstate Bank of Arizona
CA	Beverly Hills	16	City National Bank
		17	Bank of America
	Los Angeles	18	Lloyds Bank California**
		19	Central Bank**
	Oakland	20	Barclays Bank of California
		21	The Hibernia Bank**
CO	San Francisco	22	Bank of the West
		23	Central Bank of Denver
		24	First National Bank of Denver
		25	United Bank of Denver**
CT	Bridgeport	26	Connecticut National Bank**
		27	State National Bank of Connecticut
	Hartford	28	Hartford National Bank and Trust Co.
	New Haven	29	First Bank
	Waterbury	30	Citytrust
DE	Wilmington	31	Bank of Delaware
		32	Wilmington Trust
DC	Washington	33	The National Bank of Washington**
		34	Union First National Bank of Washington
FL	Fort Lauderdale	35	Landmark First National Bank of Fort Lauderdale
		36	Southeast Bank of Broward
	Jacksonville	37	Barnett Bank of Jacksonville**
	Lakeland	38	Barnett Bank of Lakeland**
	Miami	39	Barnett Bank of Miami**
		40	Southeast First National Bank of Miami
	Orlando	41	Pan American Bank of Orlando*
		42	Southeast National Bank of Orlando**

* Responses received from these banks were invalid.

** No responses were received from these banks

State	City	No.	Name of Bank
FL	Ormond Beach	43	Flagship First National Bank of Volusia County**
	Riviera Beach	44	First Marine Bank & Trust Co. of Palm Beach**
	St. Petersburg	45	Barnett Bank of St. Petersburg*
	Sarasota	46	Ellis Sarasota Bank & Trust Co.
		47	Southeast First National Bank of Sarasota
	Tampa	48	First National Bank of Florida**
	West Palm Beach	49	Flagship Bank of West Palm Beach
	Winter Park	50	Barnett Bank of Orlando/Winter Park**
GA	Atlanta	51	Fulton National Bank
		52	The Citizens and Southern National Bank
HI	Honolulu	53	First Hawaiian Bank**
ID	Boise	54	Bank of Idaho**
		55	First Security Bank of Idaho*
		56	The Idaho First National Bank**
IL	Chicago	57	American National Bank & Trust Co. of Chicago
		58	Central National Bank*
		59	Continental Illinois National Bank & Trust Co.
		60	Exchange National Bank of Chicago
		61	First National Bank of Chicago
		62	Harris Trust & Savings Bank
		63	Lake View Trust & Savings Bank**
		64	LaSalle National Bank
	Springfield	65	Northern Trust Co.
		66	Illinois National Bank of Springfield**
		67	Springfield Marine Bank*
IN	Crawdordsville	68	First National Bank
	Evansville	69	Citizens National Bank**
		70	Old National Bank
	Fort Wayne	71	Fort Wayne National Bank
		72	Lincoln National Bank & Trust Co.
	Gary	73	Gary National Bank**
	Indianapolis	74	The Indiana National Bank
		75	Merchants National Bank & Trust Co.
IA	South Bend	76	St. Joseph Bank**
	Cedar Rapids	77	Merchants National Bank
	Des Moines	78	Bankers Trust Co.
KS	Wichita	79	Iowa-Des Moines National Bank
		80	First National Bank
KY	Lexington	81	Fourth National Bank & Trust Co.
		82	First Security National Bank & Trust Co.
		83	Citizens Fidelity Bank & Trust Co.
LA	Louisville	84	Liberty National Bank & Trust Co.
		85	American Bank & Trust Co.**
		86	Fidelity National Bank**
	Lafayette	87	Louisiana National Bank
		88	Guaranty Bank & Trust Co.
		89	Calcasieu-Marine National Bank**

* Responses received from these banks were invalid.

** No responses were received from these banks.

State	City	No.	Name of Bank
LA	New Orleans	90	The Bank of New Orleans & Trust Co.
		91	First National Bank of Commerce
		92	Hibernia National Bank
		93	Commercial National Bank
ME	Portland	94	Casco Bank & Trust Co.
		95	Maine National Bank
MD	Baltimore	96	Equitable Trust Bank
		97	First National Bank of Maryland
		98	Maryland National Bank
		99	Union Trust Co. of Maryland
MA	Boston	100	First National Bank of Boston
		101	New England Merchants National Bank**
		102	Shawmut Bank
		103	State Street Bank & Trust Co.
	Burlington	104	Baybank Middlesex**
	Dedham	105	Baybank Norfolk Trust Co.**
	Quincy	106	South Shore Bank**
	Springfield	107	Third National Bank of Hampden County
	Worcester	108	Guaranty Bank
		109	Worcester County National Bank*
MI	Detroit	110	Bank of the Commonwealth
		111	City National Bank*
		112	Detroit Bank & Trust Co.
		113	Michigan National Bank of Detroit
		114	Manufacturers National Bank of Detroit
	Farmington	115	National Bank of Detroit
		116	Michigan National Bank
		117	Citizens Bank**
	Grand Rapids	118	Genesee Bank & Trust Co.**
		119	Michigan National Bank**
		120	Old Kent Bank & Trust Co.
	Kalamazoo	121	First National Bank & Trust Co. of Michigan
	Lansing	122	American Bank & Trust Co.
	Pontiac	123	Michigan National Bank
	Wyoming	124	Community National Bank of Pontiac
		125	Michigan National Bank**
MN	Minneapolis	126	First National Bank of Minneapolis
		127	National City Bank of Minneapolis
		128	Northwestern National Bank*
	St. Paul	129	First National Bank of St. Paul
		130	Northwestern National Bank of St. Paul**
MS	Grenada	131	Grenada Bank**
	Hattiesburg	132	First Mississippi National Bank
MO	Kansas City	133	Commerce Bank of Kansas City*
		134	United Missouri Bank of Kansas City**
	St. Louis	135	First National Bank of St. Louis
		136	Mercantile Trust Co.
		137	St. Louis County Bank**
NE	Lincoln	138	First National Bank & Trust Co.
NV	Reno	139	Nevada National Bank**

* Responses received from these banks were invalid.

** No responses were received from these banks.

State	City	NO.	Name of Bank
NJ	Atlantic City	140	Guarantee Bank
	Cherry Hill	141	Heritage Bank**
	Camden	142	The Bank of New Jersey**
	Elizabeth	143	The National State Bank
	Freehold	144	The Central Jersey Bank & Trust Co.**
	Hackensack	145	United Jersey Bank**
	Jersey City	146	Trust Co. of New Jersey**
	Morristown	147	American National Bank & Trust Co.**
	Newark	148	Fidelity Union Trust Co.
		149	First National State Bank of New Jersey
		150	Midlantic National Bank
	Pleasantville	151	First National Bank of South Jersey**
	Rutherford	152	National Community Bank of New Jersey**
	Totowa	153	First National Bank
	Trenton	154	New Jersey National Bank
	West Paterson	155	New Jersey Bank**
NM	Albuquerque	156	First National Bank in Albuquerque
NY	Albany	157	Key Bank**
		158	State Bank of Albany**
	Buffalo	159	Liberty National Bank & Trust Co.**
	New York City	160	The Bank of New York**
		161	The Bank of Tokyo Trust Co.
		162	Bankers Trust Co.
		163	Chase Manhattan Bank
		164	Chemical Bank
		165	Citibank
		166	Irving Trust Co.
		167	Manufacturers Hanover Trust
		168	Morgan Guaranty Trust Co.*
		169	National Bank of North America
		170	J. Henry Schroder Bank & Trust Co.
		171	United States Trust Co.
	Rochester	172	Central Trust Co.**
	Syracuse	173	Key Bank of Central New York
		174	Merchants National Bank & Trust Co.**
NC	Charlotte	175	First Union National Bank of North Carolina
		176	North Carolina National Bank**
		177	Southern National Bank of North Carolina**
	Lumberton	178	Southern National Bank of North Carolina
	Rocky Mount	179	Peoples Bank & Trust Co.**
		180	Planters National Bank & Trust Co.**
OH	Whiteville	181	United Carolina Bank
	Akron	182	BancOhio National Bank
	Cincinnati	183	The Central Trust Co.
		184	Fifth Third Bank
		185	First National Bank of Cincinnati
	Cleveland	186	Central National Bank of Cleveland**
		187	National City Bank**
		188	Society National Bank
		189	Union Commerce Bank
	Columbus	190	The Huntington National Bank

* Responses received from these banks were invalid.

** No responses were received from these banks.

State	City	No.	Name of Bank
OH	Dayton	191	First National Bank**
		192	The Third National Bank & Trust Co. of Dayton
	Toledo	193	First National Bank of Toledo*
		194	The Ohio Citizens Trust Co.
		195	Toledo Trust Co.
OK	Oklahoma City	196	Fidelity Bank
		197	First National Bank & Trust Co. of Oklahoma City
		198	Liberty National Bank & Trust Co.**
		199	Bank of Oklahoma**
	Tulsa	200	The First National Bank & Trust Co. of Tulsa
PA	Allentown	201	Merchants National Bank*
	Altoona	202	Mid-State Bank & Trust Co.
	Erie	203	First National Bank of Pennsylvania**
	Johnstown	204	United States National Bank
	Meadville	205	The Pennsylvania Bank & Trust Co.*
	Philadelphia	206	Central Penn National Bank
		207	Continental Bank & Trust
		208	Fidelity Bank
		209	First Pennsylvania Bank
		210	Girard Bank
		211	Philadelphia National Bank
		212	Provident National Bank
		213	Mellon Bank
		214	Pittsburgh National Bank
		215	Union National Bank of Pittsburgh*
		216	Bank of Pennsylvania**
		217	United Penn Bank
	Reading		
	Wilkes-Barre		
RI	Providence	218	Rhode Island Hospital Trust National Bank
SC	Columbia	219	Bankers Trust Co. of South Carolina
	Greenville	220	Citizens & Southern National Bank
TN	Chattanooga	221	American National Bank & Trust Co.
	Memphis	222	National Bank of Commerce**
		223	Union Planters National Bank of Memphis
TX	Dallas	224	Mercantile National Bank*
		225	Republic National Bank of Dallas
		226	El Paso National Bank
		227	Fort Worth National Bank
		228	Allied Bank of Texas
		229	Bank of the Southwest
		230	First City National Bank of Houston
	Houston	231	Texas Commerce Bank*
		232	First National Bank of Midland*
		233	Alamo National Bank
		234	National Bank of Commerce
		235	First Wichita National Bank of Wichita Falls
VT	Burlington	236	Chittenden Trust*
WA	Seattle	237	The Bank of California**
	Tacoma	238	Pugent Sound National Bank
WI	Milwaukee	239	Marine National Exchange Bank**
41 ←	135 ← Totals →	240	Marshall & Ilsley Bank

* Responses received from these banks were invalid

** No responses were received from these banks.

APPENDIX C: ADDITIONAL STATISTICAL TABLES

Table C-1

**Student t Values for Differences in Means of Risk Attitude and Experience Between the Control Information Level and Each of the Treatment Levels
[Classified by Presentation Mode]**

Mode	Variable Comparison	8 (Risk Attitude)		9 (Experience)	
		t Value	d.f.*	t Value	d.f.*
1	Level 1 Vs. 2	1.87**	84	.53	77
	" 1 " 3	-0.70	72	-1.05	69
	" 1 " 4	-0.96	64	0.47	76
2	Level 1 Vs. 2	-0.35	83	0.23	78
	" 1 " 3	1.38**	74	-1.09	47
	" 1 " 4	-0.87	74	0.07	67
Both	Level 1 Vs. 2	0.80	126	0.46	116
	" 1 " 3	0.31	105	-1.32**	99
	" 1 " 4	-1.05	111	0.33	104

* degrees of freedom

** Significant at $\alpha \leq 0.10$. None is significant at $\alpha \leq 0.05$.

Mode 1: SFAS 33 data are disclosed only in the notes to the financial statements.

Mode 2: SFAS 33 data are disclosed on the income statement and in the notes.

Table C-2

**Z Values from the Mann-Whitney U Test for Differences in Risk Attitude and Experience Between the Control Information Level and Each of the Treatment Levels
[Classified by Presentation Mode]**

Mode	Variable Comparison	8 (Risk Attitude)	9 (Experience)
1	Level 1 Vs. 2	1.8995*	0.1624
	" 1 " 3	0.6704	0.9336
	" 1 " 4	0.6552	0.3361
2	Level 1 Vs. 2	0.3123	0.0821
	" 1 " 3	1.0719	0.7351
	" 1 " 4	0.6153	0.4048
Both	Level 1 Vs. 2	0.9022	0.0454
	" 1 " 3	0.2474	0.9915
	" 1 " 4	0.7449	0.4328

* Significant at $\alpha \leq 0.10$. None is significant at $\alpha \leq 0.05$.

Table C-3
Canonical Discriminant Functions for Discrimination Among the 7
Groups of BLOs on the Basis of Risk Attitude, Experience, Bank
Size and Bank Activity Ratio

Function	Canonical Correlation	After Function	Wilk's Lambda	Chi-Squared	d.f.	Significance
1	.236	0	.881	29.362	24	[n.s.]
2	.197	1	.933	16.030	15	[n.s.]
3	.138	2	.971	6.870	8	[n.s.]
4	.101	3	.990	2.399	3	[n.s.]

[n.s.]: None is significant even at $\alpha \leq 0.20$.

Table C-4
F Ratios from a 2-Factor ANOVA test of Interaction Effects Between
Presentation Modes and Information Levels for Each Task Variable
[The Control Group is Ignored]

TASK VARIABLE NUMBER							d.f.
1	2	3	4	5	6	7	[num.,den.]
.470	.392	1.035	.719	1.386	.898	.344	[2 , 178]

None is significant even at $\alpha \leq 0.15$.

Table C-5

Spearman Rank-Order Correlation Coefficients for the Control Information Level (Group 1)
[Classified by Bank Size]

Bank Size	Variables	1	2	3	4	5	6	7	8	9
L	1	1.000								n = 23
	2	-.365**	1.000							
A	3	-.556*	.287	1.000						
	4	.514*	-.450*	-.450*	1.000					
R	5	.711*	-.608*	-.420*	.423*	1.000				
	6	-.463*	.450**	-.014	-.223	-.452*	1.000			
G	7	-.512*	.306**	.799*	-.591*	-.326**	-.127	1.000		
	8	-.092	-.207	.438*	-.205	-.127	-.051	.483*	1.000	
E	9	.440*	-.464*	-.498*	.436*	.333**	-.118	.408*	-.307**	1.000
	14	-.218	.113	.233	-.152	-.035	.078	.103	-.184	-.211
S	1	1.000								n = 18
	2	-.038	1.000							
M	3	-.604*	.287	1.000						
	4	.055	-.169	-.416*	1.000					
A	5	.860*	-.262	-.500*	.256	1.000				
	6	-.261	.925*	.235	.088	-.455**	1.000			
L	7	-.298	.181	.592*	-.511*	-.359**	.099	1.000		
	8	-.463*	-.246	.235	.002	-.350**	.104	.402**	1.000	
L	9	.445*	-.297	-.650*	.310	.427**	-.231	-.421**	-.051	1.000
	14	-.542*	.261	.450*	-.103	-.424*	.744*	.441*	.530*	-.285
	1	1.000								n = 41
	2	-.418*	1.000							
A	3	-.478*	.265**	1.000						
	4	.377*	-.371*	-.436*	1.000					
L	5	.740*	-.628*	-.392*	.408*	1.000				
	6	-.589*	.822*	.142	-.205	-.608*	1.000			
	7	-.363*	.249**	.712*	-.553*	-.317*	.060	1.000		
L	8	-.309*	-.099	.371*	-.131	-.242**	.087	.441*	1.000	
	9	.502*	-.488*	-.534*	.430*	.393*	-.267**	-.419*	-.265*	1.000
	14	-.373*	.246**	.348*	-.167	-.199	.385*	.218**	.071	-.306*

* Significant at $\alpha \leq 0.05$.** Significant at $\alpha > 0.05$ but ≤ 0.10 . n: Number of observations.

Table C-6

Spearman Rank-Order Correlation Coefficients for All Banks
 [First Presentation Mode: Classified by Information Level and Group]

Level	Group	Variables	1	2	3	4	5	6	7	8	9
2	2	1	1.000								n = 42
		2	-.277**	1.000							
		3	-.592*	.216	1.000						
		4	.160	-.270**	-.254**	1.000					
		5	.508*	-.273**	-.095	.410*	1.000				
		6	-.261**	.857*	.119	-.155	-.300**	1.000			
		7	-.199	.266**	.275*	-.794*	-.464*	.215	1.000		
		8	.209**	-.161	-.049	-.047	.123	-.303**	.069	1.000	
		9	-.138	-.123	.054	-.320*	-.244**	-.270**	.385*	.079	1.000
		14	-.143	.129	.079	-.237**	-.318*	.276**	.260*	-.114	.083
3	3	1	1.000								n = 30
		2	-.604*	1.000							
		3	-.560*	.420*	1.000						
		4	.150	-.021	-.437*	1.000					
		5	.772*	-.537*	-.282**	.323*	1.000				
		6	-.555*	.781*	.382*	-.246	-.524*	1.000			
		7	-.282**	.187	.504*	-.591*	-.346*	.152	1.000		
		8	-.234	.471*	.466*	-.115	-.041	.442*	.221	.000	
		9	.355*	-.315*	-.206	.209	.304*	-.339*	-.070	.079	1.000
		14	-.137	.176	-.043	-.072	-.150	.357*	-.073	.016	-.211
4	4	1	1.000								n = 37
		2	-.148	1.000							
		3	-.481*	-.052	1.000						
		4	.386*	-.098	-.496*	1.000					
		5	.509*	-.290*	-.071	.492*	1.000				
		6	-.192	.958*	.072	-.039	-.174	1.000			
		7	-.431*	.181	.630*	-.774*	-.364*	.132	1.000		
		8	-.045	.053	.019	-.058	.082	-.020	.166	1.000	
		9	-.068	.105	.082	.096	-.071	.187	-.156	-.272**	1.000
		14	-.456*	-.087	.369*	-.291*	-.278*	-.059	.301*	.135	.045

* Significant at $\alpha \leq 0.05$.** Significant at $\alpha > 0.05$ but ≤ 0.10

n: Number of observations.

Table C-7

Spearman Rank-Order Correlation Coefficients for All Banks

[Second Presentation Mode: Classified by Information Level and Group]

Level	Group	Variables	1	2	3	4	5	6	7	8	9
2	5	1	1.000								n = 41
		2	-.252**	1.000							
		3	-.459*	-.079	1.000						
		4	.291*	-.174	-.239**	1.000					
		5	.594*	-.168	-.015	.613*	1.000				
		6	-.365*	.792*	-.090	-.345*	-.403*	1.000			
		7	-.349*	.069	.244**	-.849*	-.690*	.359*	1.000		
		8	.035	.063	.020	-.041	.070	.035	-.048	1.000	
		9	-.197	-.164	0.000	.298*	-.038	-.059	-.246**	-.103	1.000
		14	-.065	.146	.030	.317*	.100	.061	-.337*	.021	.214**
3	6	1	1.000								n = 31
		2	-.585*	1.000							
		3	-.540*	.412*	1.000						
		4	.365*	-.241	-.529*	1.000					
		5	.687*	-.390*	-.372*	.364*	1.000				
		6	-.695*	.718*	.435*	-.422*	-.574*	1.000			
		7	-.415*	.177	.770*	-.665*	-.537*	.245	1.000		
		8	-.082	.444*	.352*	-.104	-.009	.267	.241**	1.000	
		9	-.372*	.012	-.113	.069	-.151	.361**	-.117	-.224	1.000
		14	.271**	.256**	-.184	-.094	.212	-.084	-.140	.083	-.512*
4	7	1	1.000								n = 32
		2	-.221	1.000							
		3	-.471*	.393*	1.000						
		4	.390*	-.345*	.394*	1.000					
		5	.766*	-.466*	-.440*	.505*	1.000				
		6	-.534*	.622*	.429*	-.493*	-.555*	1.000			
		7	-.541*	.552*	.284**	-.690*	-.759*	.642*	1.000		
		8	.144	-.117	.049	.104	.235**	-.104	-.100	1.000	
		9	-.157	-.290**	-.350*	.035	-.087	-.238	.033	-.389*	1.000
		14	-.180	.033	.367*	-.076	-.118	.438*	.210	-.021	-.262**

* Significant at $\alpha \leq 0.05$.** Significant at $\alpha > 0.05$ but ≤ 0.10 .

n: Number of observations.

Table C-8

Spearman Rank-Order Correlation Coefficients for All Banks

[Both Presentation Modes: Classified by Information Level and Group]

Level	Group	Variables	1	2	3	4	5	6	7	8	9
2	2+5	1	1.000								n = 83
		2	-.269*	1.000							
		3	-.534*	.065	1.000						
		4	.238*	-.247*	-.235*	1.000					
		5	.559*	-.225*	-.060	.506*	1.000				
		6	-.311*	.828*	.005	-.261*	-.365*	1.000			
		7	-.278*	.169**	.255*	-.804*	-.568*	.301*	1.000		
		8	.104	-.033	-.005	-.092	.080	-.073	.026	1.000	
		9	-.177**	-.138	.031	.007	-.154**	-.107	.047	-.010	1.000
		14	-.090	.054	.008	.110	-.107	.111	-.089	-.099	.131
3	3+6	1	1.000								n = 61
		2	-.576*	1.000							
		3	-.539*	.413*	1.000						
		4	.263*	-.154	-.501*	1.000					
		5	.718*	-.470*	-.314*	.356*	1.000				
		6	-.594*	.758*	.411*	-.299*	-.535*	1.000			
		7	-.364*	.176**	.628*	-.642*	-.470*	.206**	1.000		
		8	-.175**	.433*	.419*	-.127	-.004	.359*	.213*	1.000	
		9	.022	-.195**	-.158	.125	.101	-.046	-.086	-.061	1.000
		14	.017	.230*	-.089	-.116	-.023	.207**	-.088	.035	-.341*
4	4+7	1	1.000								n = 69
		2	-.195**	1.000							
		3	-.486*	.107	1.000						
		4	.372*	-.208**	-.425*	1.000					
		5	.636*	-.379*	-.235*	.470*	1.000				
		6	-.347*	.834*	.178	-.250*	-.350*	1.000			
		7	-.473*	.339*	.489*	-.761*	-.546*	.389*	1.000		
		8	.054	-.030	.026	.027	.162**	-.064	-.008	1.000	
		9	-.101	-.024	-.096	.092	-.061	.026	-.080	-.329*	1.000
		14	-.311*	-.044	.359*	-.185**	-.191**	.160	.267*	.055	-.105

* Significant at $\alpha \leq 0.05$.** Significant at $\alpha > 0.05$ but ≤ 0.10 .

n: Number of observations.

Table C-9
Partial Correlation Coefficients While Keeping Risk Attitude and Experience
Constant for All Banks [Classified by Mode, Level and Group]

Mode	Level	Group	Variables ↓	1	2	4	5	6	d.f. ^a
0	1	1	2	-.177	1.000				28
			3	.115	-.018				
			5			.127	1.000		
			6			-.211	-.579*	1.000	21
			7			-.214	.213	-.004	
1	2	2	2	-.383*	1.000				23
			3	-.470*	.675*				
			5			.235	1.000		
			6			-.280**	-.403*	1.000	21
			7			-.377*	-.061	.354*	
	3	3	2	-.413*	1.000				23
			3	-.134	.035				
			5			-.035	1.000		
			6			.089	-.313**	1.000	22
			7			-.422*	-.219	-.155	
	4	4	2	-.080	1.000				28
			3	-.333*	-.007				
			5			.222	1.000		
			6			-.210	-.071	1.000	18
			7			-.727*	-.412*	.391*	
2	2	5	2	-.297**	1.000				27
			3	-.124	.150				
			5			.142	1.000		
			6			-.328**	-.402*	1.000	23
			7			-.702*	-.297**	.323**	
	3	6	2	-.595*	1.000				22
			3	-.384*	.380*				
			5			.183	1.000		
			6			-.489*	-.516*	1.000	15
			7			-.548*	-.460*	.452*	
	4	7	2	-.277	1.000				18
			3	-.440*	.257				
			5			.573*	1.000		
			6			-.378**	-.546*	1.000	12
			7			-.846*	-.606*	.478*	
B O T H	2	2+5	2	-.331*	1.000				54
			3	-.310*	.467*				
			5			.179	1.000		
			6			-.323*	-.404*	1.000	48
			7			-.561*	-.147	.305*	
	3	3+6	2	-.506*	1.000				49
			3	-.316*	.244*				
			5			.057	1.000		
			6			-.131	-.430*	1.000	41
			7			-.485*	-.343*	.137	
	4	4+7	2	-.155	1.000				50
			3	-.349*	.052				
			5			.355*	1.000		
			6			-.286*	-.262**	1.000	34
			7			-.789*	-.457*	.426*	

* Significant at $\alpha \leq 0.05$ ** Significant at $\alpha > 0.05$ but ≤ 0.10 .

(a) Same as note (a) in Table VI-33.

APPENDIX D
ADDITIONAL EXHIBITS

Exhibit D-1

Advantages and Disadvantages of Four Financial Reporting Bases

The advantages and disadvantages of the four financial reporting bases below are summarized from the references cited in Section One of Chapter II. The advantages of the HC/ND basis are summarized mainly from Ijiri (1980).

Advantages of the HC/ND Basis

- (1) HC data are used widely in business decisions.
- (2) Past data are a basis for estimating the future.
- (3) HC data (unlike CC or CV) are available all the time on all commodities.
- (4) HC indicates the result of an action actually taken by the entity, whereas CC based on the market price is hypothetical since the entity has not acted on the market price information yet.
- (5) HC may be useful in developing 'learning curves'^a which can be built into the process of estimating future costs.
- (6) Even if a good model is available for estimating the cost in the future, HC provides a basis for developing criteria for choosing the best model among many, since people prefer to rely on a model that worked well in the past, and whether a model has worked well or not must be determined on the basis of past records. As Ijiri (1980) puts it, "sooner or later, one has to resort to the past as a basis for estimating the future."
- (7) HC is useful in uncertain environments (in which the optimal price is difficult to determine) by providing the decision maker with a basis for determining a 'satisfactory' market price.
- (8) Income under the HC/ND basis is 'hard' enough to withstand the pressure that may be placed by interested parties (government, managers, stockholders, workers, etc.) who are affected by the income figure when the proceeds are distributed.
- (9) HC statements implicitly provide assurance that records of historical resource movements exist, while statements prepared under alternative bases do not.
- (10) HC accounting enables accountants to be myopic in focusing their attention exclusively to exchanges on hand yet assures that in the long run the economic conditions of the entity's environment are gradually reflected in the accounting records and reports.
- (11) Use of CC or CV requires an evaluation of plans for replacement or disposal and selecting one out of many such plans, thus introducing more subjectivity into the measurement process. This subjectivity does not exist under the HC/ND basis.^e
- (12) It is fitting that financial statements depend on actual transactions of the enterprise because those transactions determine the changes in owners' equity in the long run. Historical prices provide the elementary measures of both the amounts invested and the amounts received in return.
- (13) Users' understanding of the effect of changing prices may be enhanced if they are able to compare the measurements in the primary (HC) financial statements with measurements that reflect changing prices.
- (14) Users are accustomed to present (HC) financial statements. [Last 3 advantages are from SFAS 33, para. 7].

Disadvantages of the HC/ND Basis

- (1) HC/ND basis tends to report inflated profits.
- (2) It does not ensure the maintenance of the firm's physical operating capacity.
- (3) Profits under the HC/ND basis cannot be regarded as a measure of 'distributable income.'
- (4) HC/ND basis may result in artificially high accounting rates of return on invested capital. This may lead to misleading measures of performance and may encourage management to continue with inappropriate production, pricing, and dividend policies. Also, management may not develop and use effective and aggressive control measures when, in fact, the situation demands such steps.
- (5) HC/ND basis's inflated profits may put the enterprise at a disadvantageous position during wage negotiations, and may even lead government agencies to suggest new requirements that the firm cannot afford.
- (6) The HC/ND basis renders the financial statements unfit for analytical and comparative purposes. Past trends both on inter- and intra-firm bases may become meaningless.
- (7) It may lead to misleading projections when analyzing proposals concerning replacements, new capital expenditures, make or buy decisions, etc.
- (8) It may increase inflationary spiral as a result of inflated profits.
- (9) It may lead to misallocation of resources as a result of the inaccurate base it provides investors and lenders.

Exhibit D-1 (Continued)Advantages of the HC/CD Basis

(1) Because it does not depart from the HC/ND basis except with respect to the measurement unit, it has all the advantages of the HC/ND basis cited above but not its disadvantages arising from the use of fluctuating measurement unit.

(2) The HC/CD basis is simple; normal HC/ND records can be retained and only year-end adjustments are needed.

(3) The presentation of financial statement items in terms of uniform units of purchasing power, rather than in varying units of money, improves interperiod comparisons.

(4) The HC/CD basis makes the results of arithmetic operations more meaningful. If the measuring unit (the dollar) fluctuates in value over time because of changes in its purchasing power, additions and subtractions of recorded amounts (under the HC/ND basis) cannot be made meaningfully.

(5) The HC/CD basis separates the portion of income generated by business activities from the portion arising as a result of changes in the general level of prices. This separation improves the meaning and measurement of net income and therefore improves decisions based on it. To maintain the purchasing power of its monetary or financial capital, a firm must generate income from its activities (i.e., before purchasing power gain or loss) in excess of any loss of purchasing power of monetary assets and equities.

(6) The HC/CD basis improves the comparative analysis of inflation effects across firms. Inflation affects different firms differently. Firms with high debt/equity ratios will report a large purchasing power gain, and firms with high percentage of fixed assets to total assets will most likely report higher depreciation expense under HC/CD than under the HC/ND basis.

(7) Government policy makers use measuring units adjusted for inflation. If firms continue to use the HC/ND rather than the HC/CD basis, they may be put in a disadvantageous position vis-a-vis government policy decisions.

(8) If the purpose is to measure the effect of inflation, this can only be adequately done with the aid of a general price level index.

Disadvantages of the HC/CD Basis

(1) Under the HC/CD basis, the restated figures for noncurrent assets are meaningless to most readers. These figures neither represent the original cost nor the market value nor the replacement cost.

(2) The HC/CD basis adjusts financial statement items using the general level of prices while, in fact, price level changes affect firms in specific and dramatically different ways.

(3) Under the HC/CD basis, the purchasing power gain or loss on monetary items is based on an index of purchasing power that may be inappropriate for the individual firm. Users of financial statements are interested in the ability of the firm to maintain the purchasing power of its monetary assets for acquiring the specific goods and services that it normally acquires.

(4) Users of financial statements are also interested in the firm's ability to cope with the effects of inflation with respect to nonmonetary items. For example, raw materials may be acquired early in anticipation of increased acquisition costs of these raw materials. A capital-intensive plant may be constructed to save expected high labor costs. Yet, under the HC/CD basis, the results of these decisions are judged against a standard based on changes in the general price level.

Advantages of the CC/ND Basis

(1) The CC/ND basis (sometimes loosely known as CV basis) enhances projections when analyzing proposals concerning replacement, new capital expenditures, make or buy decisions, etc.

(2) It allows meaningful calculation of the return on capital.

(3) It aids in pricing decisions.

(4) It improves public relations of the firm. Currently companies are showing large paper profits but paying little or no dividends.

(5) It improves the state of the economy. Inflated business profits tend to increase inflationary spiral through excessive bonuses, wages, etc.

(6) It improves allocation of resources by giving investors and lenders accurate data to base their decisions on.

(7) It prevents weakening of firms by restricting payment of dividends to 'real' profits and by aiding in implementing realistic pricing policies.

(8) It improves national income statistics.

Exhibit D-1 (Continued)

(9) It aids the company in labor negotiations. [above list was given by Gynther, 1966, pp. 213-15].

(10) It assures comparability among entities.

(11) It reveals the type of resources which the entity expects to use in its future activities.

(12) It provides a more meaningful and consistent basis for evaluating management's actions and performance. This is so because management's actions to cope with inflation are based on expected changes in the prices of specific goods and services the company normally acquires.

(13) The income statement prepared under the CC/ND basis separates income for the year into two components: operating income (or sustainable income which can be distributed without impairing the operating capability of the company), and holding gains (or losses) arising from changes in prices. These holding gains (or losses) are further classified into realized and unrealized portions. This assists financial statements users in assessing the impact of changing prices on the profitability and the maintenance of operating capability of the firm.^g

(14) The balance sheet prepared under the CC/ND basis provides a more realistic indication of the economic value of the assets and liabilities of the firm than does that prepared under the HC/ND basis.^h

(15) The CC/ND basis meets the objectives of financial statements more so than other bases. If one purpose of financial statements is to enhance the prediction of cash flows, the CC/ND basis, by taking not only current but also future cash outlays into account, meets this purpose.

Disadvantages of the CC/ND Basis

(1) The CC/ND basis injects subjectivity and 'hypothetical' data into financial reporting. Thus, it lacks reliability and verifiability which are inherent in the HC/ND basis.ⁱ

(2) The CC/ND basis may seriously affect capital markets by shifting resources away from industries showing reduced earnings.^j

(3) It fails to recognize the change in the measuring unit of money over time. These changes in the purchasing power of dollars make the CC/ND amounts on the balance sheet at the beginning and end of period noncomparable. Also, net income amounts over time under this basis are not based on a constant measuring unit.

(4) The CC/ND basis fails to recognize the changes in CC which are due to changes in the general price level, i.e., what is termed 'inflation component' included in realized and unrealized holding gains (or losses).

(5) The CC/ND basis fails to recognize the purchasing power gain or loss on net monetary items. It only recognizes holding gains (or losses) arising from changes in the cost of nonmonetary items.

Advantages and Disadvantages of the CC/CD Basis

The CC/CD basis has the advantages of both the HC/CD and CC/ND bases as far as reporting the effects of changing prices. It has the disadvantages of the CC/ND basis as far as it departs from the HC/ND basis. It also has the disadvantage (at least at the present time in the early stages of its implementation) of being technically difficult to prepare and a lot more difficult to understand by those who are not very familiar with the concepts involved and the way they are implemented.

^a If one completes a project for the first time in 100 hours, but takes only 90 hours to complete a similar project the second time around and 80 hours the third, he gradually develops a concept known as a 'learning curve' which is built into the process of estimating the time needed to complete a similar project in the future.

^b Theoretically, market price can be anything and can be totally independent of HC. One should sell the commodity at the highest possible price available irrespective of the cost. However, this notion of optimality is difficult to achieve in uncertain environment. One would not know when a bid is truly the highest that one should accept and hence stop searching. In such a situation of uncertainty, people are said to resort to the notion of satisficing. That is, instead of continuing to search for an optimum, which may even be impossible to attain, they try to set a goal and accept the first offer that meets the goal.

Exhibit D-1 (Continued)

An application of the satisficing notion may be seen in the famous problem of selecting the best offer among n offers which unfortunately come in only sequentially. The total number of offers in line is known but, of course, none of the offers is known until it is presented in sequence. As each offer comes in, one must either accept it, thus terminating the selection process, or forever lose the chance to accept that offer. If one does not accept an offer before the last one comes in, then he must accept that last offer whatever it might be. It has been shown mathematically that the probability of selecting the best offer is maximized if one lets go the first n/e offers (where e is the constant 2.718), and selects the first offer that is better than the best one among the first n/e offers that were let go. That is, one lets go roughly one-third of the offers in order to establish a standard (the satisficing criterion) and then selects the first one that meets the standard. See Gardner [1966, pp.35-43].

^c Objectivity of the HC/ND basis may not be as significant an advantage as it appears to be if it is recognized that even this basis includes many estimates (e.g., useful lives and salvage values of fixed assets, estimated warrant expenses, etc.). Current costs may similarly be estimated and verified by auditors. (See, for example, Johnson and Bell [1976, pp. 68-69], Largay and Livingstone [1976, p. 212], and Storey [1981, p. 3]).

^d Ijiri (1980) argues that the HC records gradually reflect changes in the environment in which the entity operates as the temperature inside an airplane gradually changes as a result of changes in the temperature outside the plane. He adds that "the more frequent the entity transacts in the environment, the faster the change in the environment is reflected on its records." Proponents of CC or CV models may accept this view, but they may argue that the problem is with the entity that does not transact frequently with the environment. For example, a steel company may replace its mills only once every 20 or 30 years, and when it does it may not have the needed funds (which may have been distributed as dividends) to replace the mills and continue the same level of operation unless it secures new funds from external sources.

^e However, see footnote c.

^f Government contract prices are usually determined on a cost-plus-a-mark-up basis. If the firm is performing a contract for the government and the firm uses the HC/ND basis, the contract price may be disadvantageously lower than one based on the HC/CD basis.

^g As discussed in Section Two of Chapter II, Prakash and Sunder (1979) argue strongly against this proposition.

^h It may be helpful to classify the above advantages into 3 types: (1) those of interest to the company, (2) those of interest to users of financial statements, and (3) those of interest to the society as a whole. For example, Type (1) may include advantages No. 1, 3, 4, 7 and 9; Type (2) may include advantages No. 2, 3, 6, 7, and 10 to 14; and Type (3) may include numbers 5, 6, 7, and 8. Similar classification can be made of the disadvantages of this basis as well as of the advantages and disadvantages of the other three bases.

ⁱ See, however, footnote c.

^j Proponents of the CC/ND basis may argue that this is an advantage rather than a disadvantage of this basis. If old less dynamic companies show lower earnings as a result of higher estimated CC depreciation charges, and investors and creditors feel that they should shift their resources away from these companies and toward others that are more dynamic and those that follow a program of frequent modernization, so be it. Whether investors and creditors do, in fact, shift their resources is, however, an empirical question. The present study may shed some light on this issue with respect to creditors. That is, if the study shows that commercial lenders tend to give lower amounts of loans to an enterprise disclosing inflation effects than the amounts they would give if the enterprise did not disclose these inflation effects, it may be concluded that the disclosure of inflation effects seems as if it shifts resources from companies showing reduced earnings as a result of adjustments for the effect of changing prices.

Exhibit D-2Discussion of the Eight Main Sections of Cohen et al (1966) Model Shown in Exhibit III-1

Section A is designed to answer the first question usually asked, whether the firm applying for the loan is already a customer of the bank. If the answer is yes, some of the work of credit evaluation is already done. Files main contain information on past credit experience, financial statements, and spread sheets. Loan officers may be familiar with the firm, its management, products, and markets. Still, the process continues on the main flow to see if an extensive credit check on the firm is required or not.

In Section B, if the firm is not currently a customer of the bank, the loan officer tries to answer the following four questions in forming his recommendations: (1) is the firm a sound credit risk?, (2) will this firm become a regular bank customer?, (3) will a customer relationship with this firm "build" the bank?^a, and (4) will a customer relationship with this firm be profitable?

Section C deals with the most important step in analyzing business loan applications, that is, evaluation of the credit-worthiness of the firm. This procedure is performed whenever an extensive credit investigation is needed for an existing customer or whenever a loan is considered for a firm which is new to the bank. This step has three constituent parts: (1) rating of management competence, (2) outside credit rating, and (3) financial statement analysis. Because this step is of special importance to this study it is discussed in more detail in Chapter III.

Section D is designed to check every loan application against the legal and policy restrictions of the bank. If any loan application is found to be infeasible, the reasons why the loan cannot be granted are recorded and no further processing is done on this application. Most loan applications, however, normally conform to these legal and policy restrictions.

In Section E, the answers to five key questions are analyzed: (1) for what purpose(s) does the firm want the loan?, (2) what is the proposed amount of the loan?, (3) is the loan a seasonal or a term loan?, and what is its maturity?, (4) will the firm be able to repay the loan?, and (5) is any security being offered against the loan? The answers to these questions are first considered independently, and finally together, in order to determine whether the loan should in principle be made. If the loan is recommended, it moves to Section F. Otherwise, the reasons why it is not recommended are recorded and no further processing is done on this application.

In Section F, the results of all the preceding analyses are resolved into a set of detailed recommendations regarding the terms of the loan agreement: amount, maturity, interest rate, repayment schedule, security provisions (if necessary), and the appropriate restrictive covenants. If the amount of the loan is greater than the bank's legal limit, other banks are invited to share or participate in the loan. At this stage, recommendations are also made concerning the degree of follow-up and review required for the loan.

Section G consists of relatively simple recording and filing processes in which the results of the analysis and the details of the loan recommendations or the reasons why it should be rejected are summarized for communication to appropriate bank officials and for the bank's files. This terminates the actual processing of the loan application.

In Section H, however, there is an important follow-up and review procedure for loans which have already been granted. This procedure is essential in determining and maintaining several key items of information. These include: payment performance, the extent to which forecasts made by the firm's management proved to be reliable, and the overall credit rating of the firm.

^a A customer who (either directly, or indirectly through a correspondent) significantly raises the bank's average level of deposits (or gross receipts from commissions and fees) is regarded as being a customer who builds the bank, regardless of the actual profitability of this relationship to the bank.

Exhibit D-3Discussion of the Eight Phases of RMA (1978) Model Shown in Exhibit III-2

In Phase A, the BLO determines, based upon the initial information received, whether the loan is feasible and consistent with the bank's legal and policy restrictions.

In Phase B, he determines what additional information is needed from the customer, e.g., financial statements, forecasts and projected cash flows with assumptions made, receivable/payable aging, personal financial statements, insurance information (casualty, business interruption, life on owners, etc.), appraisals, guarantees, indentures, lease agreements, union contracts, supplier and customer lists, and other management control and market data.

In Phase C, The BLO structures the loan (the customer often does not know what kind of loan is best for him) based on his assessment of the customer's needs and payment capabilities. The file then moves on to credit analysis.

In Phase D, for credit analysis purposes, the financial statement information is spread on format followed by the bank. Relevant financial ratios are computed and cash flows are analyzed. Data are reviewed to see if more are needed. Reports may be ordered, e.g., Dun & Bradstreet, Standard & Poor, or other credit data. Internal bank checking is undertaken and, where necessary, a new credit file is set up. Legal requirements, lien and subordination agreements, and related terms are checked. Some banks have their credit staffs note at this point whether in their judgment the loan should be approved. In this phase of credit analysis, the factors affecting risk management, financial condition, cash flow and controls are carefully evaluated.

In Phase E, the file, including the credit analysis work, and in some cases a recommendation to approve or to disapprove the loan, is then examined by the BLO. If additional information is needed, it may be obtained at this point. The BLO makes his decision to recommend approval or disapproval of the loan and documents his decision with a covering memorandum. If approved, the loan proceeds to the loan committee for final disposition, otherwise, it goes to the files.

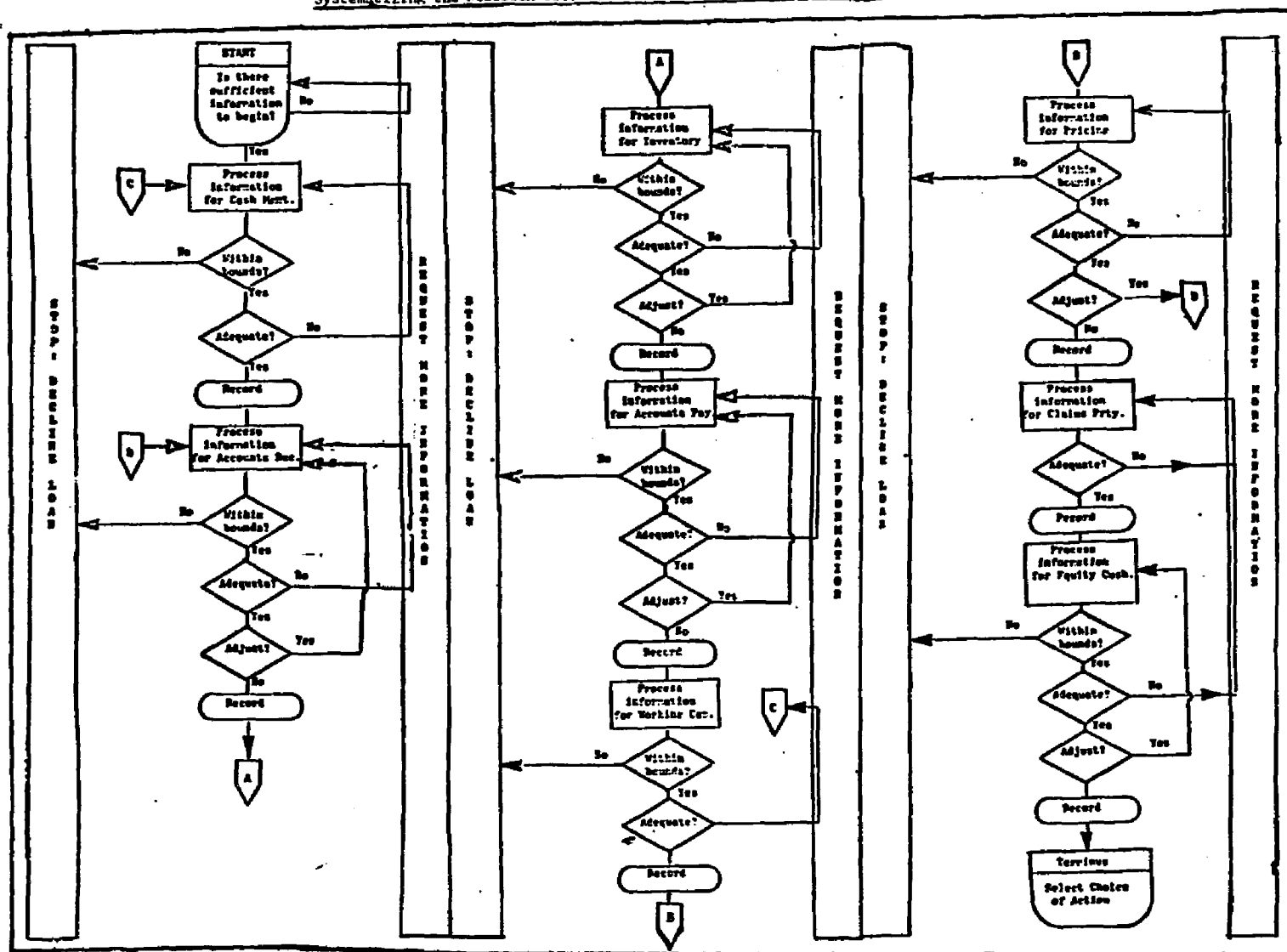
In Phase F, final approval or disapproval of the loan by the loan committee(s), which may include board of directors representation, is usually made. If the loan is not approved it goes to the files.

In Phase G, if the bank has a separate loan review function, this unit usually, at this point, reviews the file for documentation and to determine credit classification.

In Phase H, approved loans are then followed up to ensure compliance with any requirements contained in the loan agreement, and they are periodically reviewed to check on performance.

Exhibit D-4

Systematizing the Decision Processes of Bank Lending Officers for Seasonal Business Loans



KEY: Cash Management: The ability of firm's management to forecast cash needs of the firm. Accounting Rec.: ability of firm's management to set credit policies and collect credit extension. Inventory Management: Ability of firm's management to control their inventory. Accounts Pay.: Ability of firm's management to properly manage within constraints set by trade creditors, i.e., to maintain credit relationships with trade creditors. Working Cap.: The joint management of cash, accounts receivable, inventory, and accounts payable. Pricing: Ability of firm's management to obtain margins consistent with its operating characteristics, debt repayment, and dividend requirements. Claims Priority: Prior claims in assets of the firm. Equity Cushion: The amount of deterioration in asset values (from book HC) which can be sustained and still allows payment of creditors.

Source: Stephens [1978, pp. IV-46 to IV-49] adapted.

Exhibit D-5Discussion of the Five Segments of Cohen et al (1966) Computer ModelA. Is the Bank's Share of Risk Clearly Unreasonable?

This question is answered by computing the following ratios:

(1) Tangible Net Worth*/Total Debt**

* Including cash from the loan and debt subordinated to the loan but excluding intangible assets.

** Including the new loan.

This ratio is compared to industry average which is used as a minimum acceptable level (MAL). If the applicant's ratio is less than the MAL, the loan (and cash) is reduced to fit the MAL. If after reduction, the loan is too low to benefit the firm or too little for the bank to bother lending, the application is rejected.

It should be noted that this ratio could be affected by the CD and CC disclosure requirements under SFAS 33 since CC of net worth should make more sense to the bank than the book value of net worth."

(2) Funds from Operations*/Funds Required for Debt Service**

* Computed from last year income statement. It is also compared to the last 3-year average funds from operations to determine whether funds from operations are declining.

** Interest and principal payment requirements during the coming year, i.e., including the new loan.

This ratio (as well as many of the following ratios) could be affected by SFAS 33 disclosures as discussed in Chapter IV.

B. Does the Firm Have Enough Current Assets?

This question is answered by computing the following:

(1) Amount of Working Capital (including the new loan).(2) Current Ratio.

(1) above is compared to a 3-year average working capital, and (2) is compared to an average for the industry. Based on these comparisons, a tentative solvency rating for the firm is determined from among the following scores: High, Average, Low, Low-, and Reject as illustrated in Exhibit D-5-1.

C. Are the Firm's Current Assets Sufficiently Liquid?

This question is answered by computing the following:

(1) [Cash + Marketable Securities (M.S.)]/Current Liabilities.(2) [Cash + M.S. + Receivables]/Current Liabilities.(3) Inventory/3-Year Average Inventory.(4) Inventory/Current Assets.

(1) and (2) above are computed using proforma balance sheet, i.e.,

Exhibit D-5 (Continued)Exhibit D-5-1

DECISION STRUCTURE TABLE FOR TENTATIVE SOLVENCY RATINGS

Firm's Net Working Capital*	Percentile Value (in Its Industry) of the Firm's Current Ratio*	Median Current Ratio of the Industry	Ratio of Firm's Net Working Capital* to Firm's 3-Year Average Net Working Capital	Firm's Current Ratio*	Firm's Tentative Solvency Rating
≥ 50%	> 50%	≥ 2	< 1		Average
≥ 50%	≤ 50%	≥ 2	≥ 1		Reject
≥ 50%	≤ 50%	≥ 2	≥ 1		Low minus
≥ 50%	≤ 50%	< 2			Low
≥ 50%	≥ 75%				High
< 75% and ≥ 25%				≥ 2	Average
> 25%				≥ 2	Low
		≥ 2	< 1		Low minus
		≥ 2	≥ 1	< 2	Low
< 75% and ≥ 25%		< 2 and > 1.5		< 2	Average
< 25%		< 2 and > 1.5		< 2	Low
< 75% and ≥ 50%		< 1.5		< 2	Average
< 50%		< 1.5	< 1	< 2	Low minus
< 50%		< 1.5	≥ 1	< 2	Low

* Based on the firm's pro forma balance sheet.

Source: Cohen et al [1966, p. 244].

including the new loan, and (2) & (4) are compared to industry averages.

Based on the above and on the tentative solvency rating developed in (B), a final solvency rating is determined as illustrated in Exhibit D-5-2.

Exhibit D-5-2

DECISION STRUCTURE TABLE FOR FINAL SOLVENCY RATINGS*

Firm's Ratio of Cash to Total Current Liabilities	Percentile Value (in Its Indus- try) of the Firm's Ratio of Cash Plus Receivables to Total Current Liabilities	Ratio of Firm's Present Income to Firm's 3-Year Average Income	Percentile Value (in Its Indus- try) of the Firm's Ratio of Income to Current Assets	Firm's Tentative Solvency Rating	Firm's Final Solvency Rating
< 10%		≥ 10%	≥ 10%	High	Average
≥ 10%		< 10%	< 10%	High	High. Print warning: purchases postponed!
< 10%		< 10%	< 10%	High	Average. Print warning: purchases postponed!
≥ 10%		≥ 10%	≥ 10%	High	High
< 10%		≥ 10%	≥ 10%	Average	Average
≥ 10%		< 10%	< 10%	Average	Average. Print warning: purchases postponed!
< 10%		< 10%	< 10%	Average	Average. Print warning: purchases postponed!
≥ 10%		≥ 10%	≥ 10%	Average	Average
< 10%	≥ 50%			Low	Low
< 10%	< 50%			Low	Low minus
< 10%	≥ 50%			Low minus	Low minus
< 10%	< 50%			Low minus	Reject
≥ 10%		≥ 1		Low	Low
≥ 10%	< 50%	< 1		Low	Low minus
≥ 10%	≥ 50%			Low minus	Low
≥ 10%	< 50%	≥ 1		Low minus	Low
≥ 10%	< 50%	< 1		Low minus	Low minus

* In this table, "high" should be interpreted as "high plus marketable securities." Except in comparing the firm's 3-year average income to the firm's pro forma balance sheet is used throughout this table.

Source: Cohen et al [1966, p. 245].

D. Is the Firm Sufficiently Profitable?

The profitability rating (from among the same 5-score scale) of the applicant is determined based on 13 factors shown in Exhibit D-5-3.

Exhibit D-5 (Continued)

Exhibit D-5-3
Factors Determining Profitability Rating

1. Three-year average net profits.
2. Trend of net profits.
3. Proforma net profit.
4. Firm's percentile in industry: Trend in net profits.
5. [Industry median ratio of pre-tax profits to total tangible assets]/
Prime interest rate.
6. Firm's ratio of pre-tax profits to total tangible assets/Prime rate.
7. Firm's percentile in industry: Pre-tax profits/total tangible assets.
8. Firm's percentile in industry: Inventory turnover rate.
9. Firm's percentile in industry: Net Profit/tangible net worth.
10. Firm's percentile in industry: Net profit.
11. Firm's percentile: Ratio of pre-tax profits to total tangible assets;
only those firms for which this ratio exceeds the prime rate.
12. Type of loan: Seasonal or term.
13. Industry median trend in net profits.

Source: Cohen et al [1966, p. 246] adapted.

E. What is the Final Credit Rating of the Firm?

For those applicants which have not already received a 'Reject' credit rating, the solvency and profitability ratings are combined into an overall credit rating. This combination differs depending on whether the loan is seasonal or term. The final credit rating also includes, beside above, a rating of management competence and an outside credit rating both of which would be obtained by the SLO to be included as an input variable in the computer model.

It is clear that management evaluation and outside credit ratings are separated from the credit evaluation using financial statement information. Even though evaluation of management may not be based entirely on accounting information, it seems that it would include accounting information. As observed by Bedford [1973, p. 6]:

"Mere disclosure of economic activity, however, is an incomplete description of the nature of accounting disclosures, for the accounting measures reveal not only the economic activity but also the business effectiveness with which the activity is performed."

Furthermore, it seems that there could be an interaction in information processing between collection of outside credit ratings and processing of accounting information. This interaction could be in either direction, i.e., outside credit ratings could affect processing of accounting information and vice versa. In fact, examination of the output of Cohen et al (1966) credit evaluation model indicates that this interaction could take place.^a

^aSee Exhibit D-5-2 for reference to warnings to be printed.

NAME		DOLLARS					
ASSETS		\$	\$	\$	\$	\$	\$
1 Cash							
2 Marketable Securities							
3 Accounts Receivable							
4 Inventory							
5 Prepaid Expenses							
6 Other Current Assets							
7 TOTAL CURRENT ASSETS							
8 Fixed Assets—Net							
9 Land							
10 Buildings							
11 Equipment							
12 Other Fixed Assets							
13 TOTAL NONCURRENT ASSETS							
14 TOTAL ASSETS							
LIABILITIES							
15 Notes Payable—Bank							
16 Accounts Payable							
17 Other Current Liabilities							
18 TOTAL CURRENT DEBT							
19 Long Term Debt							
20 Other Noncurrent Liabilities							
21 TOTAL NONCURRENT DEBT							
22 TOTAL UNCOORDINATED DEBT							
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Source: RMA [1978, pp. 32-33].

Exhibit D-7Sample of Letters of Comment on the Exposure Draft Prior to Issuing SFAS 33Exhibit D-7-1Letter Representing the Banks' View Regarding Financial Statements of the Financial Institutions

Mr. Alan McKanon, Vice President (VP), First Financial Boston Corporation, wrote:

"For bank reporting purposes, CD is preferred over CC because it (CD) can be applied meaningfully for industries which may or may not be heavily fixed asset oriented, and also because it is relatively objective in nature.

We agree with the preliminary report of the Banking Task Group that the use of end-of-year dollars leads to a more understandable presentation."

Exhibit D-7-2Letters Representing the Banks' View Regarding Financial Statements of the Industrial Corporations

Mr. Harvey N. Gillis, Sr. VP and Controller, Seafirst Corporation (subsidiary of Seattle Financial National Bank) referring to industrial companies, wrote:

"We believe that restatement of HC/ND income to HC/CD is inappropriate. We believe that certain selected data, i.e., inventory and PPE, derived under the proposed CC would assist in the assessment of FCFs, and accordingly, should be presented as supplemental information to basic financial statements.

We are opposed to all forms of CD indexing and to the derivation of a second net income figure under any measurement approach."

Charles Montgomery, Executive VP and Controller, First Chicago Corporation, wrote:

"In our opinion, the adoption of CD accounting will not provide financial information that is any more than marginally useful for investment or credit decisions made by banks. As creditors, much supplemental financial information is already available to us to assist our evaluations of customer credit worthiness. Additional CC information may be helpful to our analysis, but CD information will, at best, be only superficially useful to us in dealing with individual customers.

Such information including the effects of CC on COGS and depreciation expense is useful to investment and credit analysis because it provides additional insight into those aspects of the earning activities of the enterprise that have been or will be affected by specific changes in prices of tangible assets unique to the given enterprise."

Mr. Thomas W. Frye, VP, First Pennsylvania Bank, preferred CC over CD information for real estate companies. He wrote:

"A primary objective of credit analysis is to measure a company's capacity to generate cash to cover 'below the line' items (i.e., debt repayment, capital improvement, and dividends). Two determinations are made by the lender in assessing coverage of below the line items: (1) The first is to convert the operating statement to a pure cash basis to estimate cash flow generated from operation (CFO). If CFO is sufficient to curtail all current obligations, then there is a reason to be gratified, and very little additional analysis remains. If not, a second determination must be made.

(2) This may be called 'reserve potential.' This entails an in-depth look at the borrower's assets on a project by project basis to make a determination of value (as opposed to historical cost)

Exhibit D-7 (Continued)

In a capsule, in terms of the operating statement, it is not earnings that means success, or lack thereof-- but cash flow. For example, depreciation when used in the computation of net earnings of an investment builder causes serious distortions regarding operating success in an industry that has now become accustomed to asset appreciation. In terms of the balance sheet, it is not historic cost necessarily, but the lender's appraisal of both value and marketability of the asset which becomes important."

Exhibit D-7-3Letters Representing Financial Analysts' View

Mr. Gerald I. White, Chairman of the Financial Analysts Federation, preferred CC expressed in nominal dollars only, i.e., CC/ND. He wrote:

"Financial statements users live in the world of nominal dollars. Stock prices, dividends, and interest, and the cash flows which are the raison d'être of financial analysis, are stated in nominal dollars.

CC data, on the other hand, are at least relevant. The effect of inflation specifically on a company is relevant, and hence potentially useful. The conversion of financial statements to units of constant purchasing power is not."

Mr. Martin W. Davenport, VP, W.H. Newbold's Son & Co., Philadelphia, Pa., stated:

"I concur with the Board that something must be done to augment the typical content of financial reports so as to provide more information about the effects of price changes.

I believe that provision of information on an HC/CD basis would further confuse an already confused investing public, and I respectfully suggest that all enterprises [subject to SFAS 33] be directed to supply supplementary information on CC basis only."

He suggests that for CC of goods sold, companies should use LIFO, and that CC depreciation be based on depreciable assets valued at current prices.

Exhibit D-8An example illustrating that Current Operating Profits Equal Funds Flow Available for Expansion and Distribution

A business is formed on 1/1/19x1 with capital of \$600 in cash. It immediately purchases 6 units of inventory at \$100 each. It holds the inventory until 12/31/19x1 when it sells the items for \$150 each. On the same day, it buys 7 units, identical to those sold, at \$120 each (an increase of \$20 per item over the previous buying price). The cash available at end of the year (ignoring other expenses) is \$60, computed as follows:

Cash received from sale (6 units @ \$150)	\$900
Less cash payments for purchases (7 units @ \$120)	<u>840</u>
Cash Balance	<u>\$ 60</u>

Income in the HC financial statements, assuming the company uses FIFO, would be \$300, computed as follows:

Sales revenue (6 units @ \$150)	\$900
Less cost of sales (6 units @ \$100)	<u>600</u>
HC Income	<u>\$300</u>

A fund statement prepared on cash basis would read as follows:

Income	\$300
Less increase in inventory (\$840-\$600)	<u>240</u>
Cash Provided by Operations	<u>\$ 60</u>

The \$240 increase in inventory is attributable partly to the increase in the number of units held (from 6 to 7), and partly to the increase in the unit cost of inventory (from \$100 to \$120). The funds statement illustrated above does not distinguish the effect of changes in quantities from the effect of changes in prices. Consequently, it does not give users information that facilitates assessments of whether an enterprise has maintained (or increased or decreased) its operating capability.

To provide more information, the funds statement may be formulated as follows:

Income	\$300
Less: amount required to maintain operating capability (i.e., same volume of inventory: CC of sales adjustment — 6 units @ \$20)	<u>120</u>
Funds available for expansion and distribution	\$180
Less: amount used for expansion (i.e., increase in number of units of inventory— 1 unit @ \$120)	<u>120</u>
Cash available for Distribution	<u>\$ 60</u>

However, the COP under SFAS 33 would be equal to the funds available for expansion and distribution, i.e., \$180, computed as follows:

Sales revenue (6 units @ \$150)	\$900
Less: CC of goods sold (6 units @ \$120)	<u>720</u>
Current Operating Profit (COP)	<u>\$180</u>

If we take from COP the amount needed for expansion of OC, i.e., \$120, the balance will represent the cash available for distribution. Of course, expansion of OC may be financed in whole or in part by issuing additional debt or equity securities, thus leaving an amount greater than \$60 for distribution, provided OC has been maintained.

Exhibit D-9
Additional Benefits of CC Data

Castellano (1978) proposes several performance measures that he believes will be enhanced by RC data provided under ASR 190. Following is a summary and adaptation of these measures using SFAS 33 disclosures and why these disclosures should improve these measures.

(a) Average Economic Life (AEL) of Aggregate Assets

Edwards and Bell (1961) have described an asset as a 'bundle of asset service.' That is, the asset's value (V) is not its cost, but the annual charge for its services [say, DEP, for depreciation] multiplied by the number of years the asset will be serviceable [say, N]. Using this concept of value, Castellano (1978) argues that if CC depreciation expense is reported on a straight line basis [this is the usual case under SFAS 33], and if V and DEP are known, it is possible to determine the average economic life (AEL) of aggregate assets as follows:^a

$$AEL = \frac{\text{Average Gross CC}}{\text{CC Depreciation}}$$

The significance of AEL, computed as above, is that it allows the user to consider the relative importance of asset price changes and the frequency of technological improvement. A long AEL may allow a firm to ignore short-lived yet substantial changes in the relative prices of assets. That is, it allows a firm to decide precisely when it will enter the market to purchase new assets. However, the firm pays a price for this flexibility: a long AEL will make it more difficult to implement a new technology rapidly. A short AEL makes a firm very sensitive to asset price changes because this firm has much less choice when to enter the market to purchase assets. However, it will be relatively easy for such a firm to implement new technology more rapidly than a firm with a long AEL.

These effects dominate at different ends of the AEL spectrum. Hence, an optimal AEL may exist for each industry. This optimum, however, depends on the relative likelihood of these events in the particular industry. If technological change is frequent, then a short AEL is more efficient, whereas if prices fluctuate widely, a longer AEL is advised.

(b) Average Age (AA) of Aggregate Assets

Another parameter of interest is the average age (AA) of aggregate assets defined as follows:^b

$$AA = \frac{\text{Average Gross CC} - \text{Average Net CC}}{\text{CC Depreciation}}$$

The interpretation of AA is that assets now held were purchased, on

Exhibit D-9 (Continued)

average, AA years ago. The significance of AA is that it has certain information content. The time series AA may reflect management's policies toward asset replacement in the face of technological advances and price changes. Also, a short AA firm is far more sensitive to technological innovation than a long AA firm, assuming a common AEL. If the technological improvement is of sufficient magnitude, it would render the newly purchased assets of the short AA firm obsolete, putting it at a severe competitive disadvantage to a long AA firm that was just preparing a major asset acquisition program. However, the degree of sensitivity depends upon AEL, since it is the relative gap between AA and AEL that is related to the loss of competitive position resulting from a major shift in technology. For this reason, a new parameter is needed to quantify a firm's AA with respect to its AEL. That parameter may be called the age index and is defined below.

(c) Age Index (AI)

$$AI = \frac{AA}{AEL} = \frac{\text{Average Gross CC} - \text{Average Net CC}}{\text{Average Gross CC}}$$

Because of the normalization by AEL, this index can be used to compare the relative ages of aggregate assets across industries. An industry with unusually diverse AEL among its firms will need AI to compare ages since to use AA the user must make some assumption about the commonality of AEL in the sample.

AI has essentially the same meaning as that of the AA. As AI gets large, maintenance expense increases, but the sensitivity to technological change decreases, and vice versa.

(d) Change in Asset Value (CAV)

Another ratio of interest is change in asset value (CAV), defined as follows:

$$CAV = \frac{\text{Gross CC}}{\text{Gross HC}}$$

CAV contains two important and offsetting elements: (1) an inflation premium (IP), and (2) a technological improvement premium (TIP).^c Essentially, CAV is a percentage measure of how many nominal dollars, AA years old, would be required to be invested to obtain a similar productive capacity. CAV, therefore, allows an adjustment to real dollars. Furthermore, a time series for CAV would be of interest to financial analysts planning long-term investment because it could indicate relative effects of inflation and technological improvement for a firm, or for an industry.^d

Exhibit D-9 (Continued)(e) Technological Improvement Premium (TIP)

It may be useful to remove IP from CAV time series to allow a direct observation of TIP. This can be done by defining TIP as follows:

$$TIP = 1.0 + IP - CAV$$

IP can be defined as the decline in the value of the dollar over the past AA years. This may be calculated using the CPI-U.

TIP is a measure of the cumulative impact of new technology, in the last AA years, on the CC of a firm's assets. Since AA and TIP are directly related, it may be assumed that the relationship is reasonably linear over periods of 10 years or less. Thus, to remove the dependence of TIP upon AA, a new measure can be computed that may be called average annual TIP (or $\overline{TIP}$) and defined as follows:

$$\text{Average Annual TIP} = \overline{TIP} = \frac{TIP}{AA} = \text{TIP Per Year}$$

This $\overline{TIP}$ may be very useful in comparing one industry with another. If time series TIP is accumulated, a series of marginal TIPs can be generated by taking the first difference of the original TIP series. A comparison of the marginal TIP with the annual inflation rate yields information about how the nominal level of investment required to maintain productive capacity changes from year to year. If the marginal TIP is greater than IP, a smaller nominal investment is needed to maintain productive capacity. Also, comparing a firm's marginal TIP with that for the industry can indicate how well a firm is employing new technology with respect to its competition.

^a It should be noted that the CC amount, economic life, and depreciation expense may be estimated separately for each individual asset or group of similar assets, but the above equation will indicate the AEL of aggregate assets (as a whole).

^b The numerator of the equation may also be defined as 'Average Accumulated CC Depreciation.'

^c The CC of gross assets reflects both the impact of inflation on the general value of the dollar since the assets were purchased, and the effect of technological innovation on the productivity of the assets.

^d If inflation continues, a CAV time series will increase in the absence of technological innovation. If CAV time series stabilizes, or begins to decrease, the user can be certain that the frequency of technological innovation is increasing and eventually dominating the inflation rate. The directions of these two trends imply different investment strategies. A downward trend indicates that intensive investment could be a serious mistake because technology is advancing rapidly. An upward trend is more difficult to interpret. It may be due to high inflation rate masking a high, but slightly smaller, rate of change in technology. Or it may be due to small inflation rate and no change in technology. Thus, inflation rate must be known in order to estimate the rate of technological change.

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